Allied Paper, Inc./Portage Creek/ Kalamazoo River Superfund Site Kalamazoo, Michigan

Final Technical Memorandum 14 Biota Investigation

Appendix E

Data Quality Review Reports
Volume I

January 2002

Technical Memorandum

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 39990

PCB ANALYSES

TERRESTRIAL BIOTA - EARTHWORMS

Analyses performed by:

Aquatec, Inc. Colchester, Vermont

Review performed by:

Blasland, Bouck & Lee, Inc. Syracuse, New York

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

<u>Identification</u>

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

There is no specified holding time for extraction of biota samples; however, all samples must be analyzed within 40 days of extraction. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method, field or rinse blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure contamination of samples during field operations.

No target compounds were detected in the method blanks or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in samples K46000, K46006 and K46014. All data for these samples have been qualified as estimated. Samples K46004, K46005, K46007, K46008, K46009 and K46014MS had one surrogate recovery below acceptable control limits. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries were within acceptable control limits. The relative percent differences (RPD) between matrix spike and matrix spike duplicate recoveries were above the acceptable control limits. No qualifiers were added to the samples based on this deviation.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

9. General Comments

The recommended data usage for the sample reanalyses is as follows:

K46010 and K46010-RE

Sample K46010 was originally analyzed at a 1:10 dilution due to a laboratory accident during GPC cleanup procedure. The sample was subsequently re-extracted and reanalyzed undiluted. Data from the reanalysis K46010-RE should be used for all compounds.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
is there a narrative or cover letter present?	<u>X</u>		
Are the samples numbers included in the narrative?	<u> x</u>		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		<u>x</u>	•
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	<u>X</u>		
Are the outliers correctly marked with an asterisk?	<u> </u>		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>x</u>		
If yes, were the samples reanalyzed?		X	
Matrix Spikes		-	
Is there a matrix spike recovery form present?	<u> </u>		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?		•	
<u>0</u> out of <u>4</u>			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
	•		
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		x	
Do any field/rinse blanks have positive results?			x
Are there field/rinse/equipment blanks associated with every sample?	x		
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	x		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	<u>x</u>		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	×		<u> </u>
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	× x		
Are %D values for all compounds within limits (less than 15%)?	×		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		<u> </u>
Was the proper analytical sequence followed?	X		

PCB Data Review Checklist - Page 3

	YES	NO	NA
Cleanup Efficiency Verification			-
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	X		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	<u>x</u>		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Lie	mits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Where field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding	Surrogates	- Column 1	Surrogates	Column 2
	Time	TCX	DCB	TCX	DCB
K46000	OK for all	↓ (35)	↓ (47)	† (33)	↓ (45)
K46001	. samples				
K46002					
K48003					
K46004		Į (51)		↓ (50)	
K46005		J (51)		↓ (50)	
K46006		↓ (20)	↓ (20)	ļ (29)	↓ (28)
.K46007		↓ (52)		↓ (51)	
K46008				↓ (58)	
K46009		↓ (57)		Į (54)	
K46010					
K46010RE				_	
K46011					
K46012					
K46013					
K46014		↓ (17)	↓ (17)	↓ (26)	† (26)
K46014MS		↓ (52)		↓ (51)	
K46014MSD					
			,		

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

- Surrogates diluted out Recovery high Recovery low D

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2087</u> Column: <u>RTX-35 / RTX-5</u>

Date:	2/15/94 1833	2/18	2/18	2/19	2/19	2/19	2/19
Time;	la 2/16/94 1453	1645	1721	0032	0108	0818	0854
•	Initial Cal,	Cont. Cal.	Cost. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	- %0	50	% D	Q	%D	%D
Aroclor 1016	4.7 / 4.5				10.5		
Aroclor 1221	4.5 / 3.2						
Arocior 1232	4.6 / 3.3						
Arocior 1242	5.4 / 3.8						6.0
Aroclor 1248	4.2 / 4.2	5.0		5.0		2.0	
Aroclor 1254	4.5 / 3.4						
Aroclor 1260	3.7 / 3.4		3.5				
Tetrachioro-m-xylene	10.1 / 7.1						
Decachlorobiphenyl	5.7 / 8.2	.					
Affected Samples:							
			, :				
			<u> </u>				
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				øs.			

PCB Calibration Summary - Page 2

Instrument: <u>HP2087</u> Column: <u>RTX-35 / RTX-5</u>

Date:		2/19	2/19				
Time;		1504	1840				
	initial Cal.	Cont.	Gont.	Cont.	Cont.	Cont.	Cont.
	%R\$D	Cat	Gel. %D	Cal. %O	Cal. %D	Cal. %D	Cal.
Aroclor 1016		-					
Aroclor 1221							
Aroclor 1232			·				
Aroclor 1242							
Aroclor 1248		4.5					
Aroclor 1254			1.0				
Aroclor 1260							
Tetrachioro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							
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CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO.

K46000

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39990

Phase Type: **BIOTA** Lab Sample ID: 200345 Phase Weight: 10.1 **Date Received:** 10/09/93 **(g)** 1.0 **Date Extracted:** 02/01/94 Injection Volume: (uL) 1.0 Dilution Factor: 02/19/94 Date Analyzed: Sulfur Clean-up: N (Y/N)

(mg/Kg)	<u>Q</u>
0.050	n 1
0.050	UJ
0.050	UJ
0.050	0.2
0.050	UJ
0.050	ני ט
0.023	J
	0.050 0.050 0.050 0.050 0.050

Lab Code:

Case:

EPA SAMPLE NO.

K46001

SDG: 39990

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 1.0

Aquatec, Inc.

91082

Lab Name: _

Contract:

 Lab Sample ID:
 200346

 Date Received:
 10/09/93

 Date Extracted:
 02/01/94

 Date Analyzed:
 02/19/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION	^
		(mg/Kg)	<u>C</u>
12674-11-2	Aroclor-1016	0.050	Ų
11104-28-2	Aroclor-1221	0.050	Ų
11141-16-5	Aroclor-1232	0.050	7
53469-21-9	Aroclor-1242	0.050	_
12672-29-6	Aroclor-1248	0.050	7
11097-69-1	Aroclor-1254	0.050	
11096-82-5	Aroclor-1260	0.024	

AQUAI

BIO

EPA SAMPLE NO.

K46002

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39990

200347 Phase Type: **BIOTA** Lab Sample ID: 10/09/93 Phase Weight: 10.0 **(g) Date Received:** Injection Volume: 1.0 (uL) Date Extracted: 02/01/94 Dilution Factor: 1.0 Date Analyzed: 02/19/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	U
11096-82-5	Aroclor-1260	0.025	J

EPA SAMPLE NO.

K46003

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39990

BIOTA Lab Sample ID: 201526 Phase Type: 10.0 **Date Received:** 10/14/93 Phase Weight: **(g)** 02/01/94 1.0 (uL) **Date Extracted:** Injection Volume: Dilution Factor: 02/19/94 5.0 Date Analyzed:

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	2.5	
11097-69-1	Aroclor-1254	0.25	υ
11096-82-5	Aroclor-1260	0.25	U

EPA SAMPLE NO. K46004 Lab Code: **AQUAI** Lab Name: Aquatec, Inc. 39990 91082 Case: BIO SDG: Contract: **BIOTA** Phase Type: Lab Sample ID: 201527 Phase Weight: _ 10.0 **(g)** Date Received: 10/14/93 Injection Volume: 1.0 (uL) **Date Extracted:** 02/01/94 Dilution Factor: _ 2.0 Date Analyzed: 02/19/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.10	l
11104-28-2	Aroclor-1221	0.10	_ ι
11141-16-5	Aroclor-1232	0.10	
53469-21-9	Aroclor-1242	0.10	
12672-29-6	Aroclor-1248	1.4	
11097-69-1	Aroclor-1254	0.73	
11096-82-5	Aroclor-1260	0.10	·

Lab Name: Aquatec, Inc.

91082

BIOTA

10.0

1.0

5.0

Contract:

Phase Type:

Phase Weight:

Dilution Factor:

Injection Volume:

EPA SAMPLE NO. K46005 Lab Code: **AQUAI** Case: BIO SDG: 39990 Lab Sample ID: 201528 (0) **Date Received:** 10/14/93 (uL) **Date Extracted:** 02/01/94

Date Analyzed:

Sulfur Clean-up:

02/19/94

N

(Y/N)

(mg/Kg)	1 0
0.25	U
221 0.25	U
232 0.25	U
242 0.25	U
248 2.0	
254 1.2	
260 0.25	U
	016 0.25 221 0.25 232 0.25 242 0.25 248 2.0 254 1.2

EPA SAMPLE NO. K46006 Lab Name: Aquatec, Inc. Lab Code: **IAUDA** Contract: 91082 Case: BIO SDG: 39990 Phase Type: **BIOTA** Lab Sample ID: 201529 Phase Weight: 6.7 Date Received: 10/14/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 02/01/94 Dilution Factor: ____ Date Analyzed: 02/19/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.075	U-
11104-28-2	Aroclor-1221	0.075	υŢ
11141-16-5	Aroclor-1232	0.075	U
53469-21-9	Aroclor-1242	0.075	UĘ
12672-29-6	Aroclor-1248	0.92	-
11097-69-1	Aroclor-1254	0.39	-
11096-82-5	Aroclor-1260	0.075	υį

EPA SAMPLE NO. K46007 Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 Contract: Case: _ BIO SDG: 39990 **BIOTA** 202392 Phase Type: Lab Sample ID: Phase Weight: 10/27/93 8.3 Date Received: **(g)** 1.0 Injection Volume: (uL) Date Extracted: 02/01/94 Dilution Factor: 2.0 Date Analyzed: 02/18/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	ΟN <u>Ω</u>	
12674-11-2	Aroclor-1016	0.13	υ	
11104-28-2	Aroclor-1221	0.13	U	
11141-16-5	Aroclor-1232	0.13	Ų	
53469-21-9	Aroclor-1242	0.13	U	
12672-29-6	Aroclor-1248	1.8		
11097-69-1	Aroclor-1254	0.41		
11096-82-5	Aroclor-1260	0.13	U	

EPA SAMPLE NO. K46008 Lab Code: AQUAI Lab Name: Aquatec, Inc. 39990 BIO 91082 Case: SDG: __ , Contract: _ Phase Type: Lab Sample ID: 202393 **BIOTA** Phase Weight: 5.0 **Date Received:** 10/27/93 **(g)** Injection Volume: (uL) 1.0 Date Extracted: 02/01/94 Dilution Factor: 1.0 02/18/94 Date Analyzed: Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.5	
11097-69-1	Aroclor-1254	0.69	
11096-82-5 Aroclor-12	Aroclor-1260	0.10	U

EPA SAMPLE NO. K46009 Lab Code: **AQUAI** Lab Name: Aquatec, Inc. 91082 BIO 39990 Contract: Case: SDG: Lab Sample ID: 202394 Phase Type: **BIOTA** 10/27/93 Phase Weight: 10.0 **Date Received: (g)** Injection Volume: 1.0 (uL) Date Extracted: 02/01/94 1.0 Dilution Factor: Date Analyzed: 02/18/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	Ų
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	Ü
11096-82-5	Arocior-1260	0.050	U

EPA SAMPLE NO.

K46010

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39990

Phase Type: **BIOTA** Lab Sample ID: 202395 Phase Weight: 10.0 (0) Date Received: 10/27/93 Injection Volume: 1.0 (uL) **Date Extracted:** 02/01/94 Dilution Factor: _ 10.0 Date Analyzed: 02/18/94 Sulfur Clean-up: N (Y/N)

> CAS NO. CONCENTRATION **COMPOUND** Q (mg/Kg) 12674-11-2 Aroclor-1016 0.50 U 11104-28-2 Aroclor-1221 0.50 U U 11141-16-5 Aroclor-1232 0.50 53469-21-9 Aroclor-1242 0.50 U 12672-29-6 Aroclor-1248 0.50 U 11097-69-1 0.50 U Arocior-1254 11096-82-5 Aroclor-1260 U 0.50

EPA SAMPLE NO. K460108É Lab Code: AQUAI Lab Name: Aquatec, Inc. SDG: BIO 39990 91082 Case: . Contract: Phase Type: **BIOTA** Lab Sample ID: 202395R1 10/27/93 Phase Weight: 8.5 (g) Date Received: 1.0 Injection Volume: (uL) Date Extracted: 02/03/94 1.0 02/19/94 Date Analyzed: Dilution Factor: Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.059	U
11104-28-2	Aroclor-1221	0.059	U
11141-16-5	Aroclor-1232	0.059	U
53469-21-9	Aroclor-1242	0.059	U
12672-29-6	Aroclor-1248	0.059	U
11097-69-1	Aroclor-1254	0.059	U
11096-82-5 Aroclor-1260		0.059	U

EPA SAMPLE NO.

K46011

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39990

Phase Type: **BIOTA** Lab Sample ID: 202396 Phase Weight: Date Received: 10.0 **(g)** 10/27/93 Injection Volume: 1.0 (uL) Date Extracted: 02/01/94 Dilution Factor: 1.0 Date Analyzed: 02/18/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.050	Ų
11096-82-5	Aroclor-1260	0.050	U

EPA SAMPLE NO.

K46012

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 39990

Contract: 91082 Case: BIO SDG: 39990

Phase Type: BIOTA Lab Sample ID: _ _ _ 202397 Phase Weight: 10.0 **Date Received: (g)** 10/27/93 Injection Volume: (uL) Date Extracted: 1.0 02/01/94 Dilution Factor: 1.0 Date Analyzed: 02/18/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	_ U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.41	
11097-69-1	Aroclor-1254	0.25	
11096-82-5	Aroclor-1260	0.050	U

EPA SAMPLE NO. K46013 Lab Name: Aquatec, Inc. Lab Code: **AQUAI** · Contract: 91082 Case: BIO SDG: 39990 Phase Type: **BIOTA** Lab Sample ID: 202398 Phase Weight: 10.0 **(g) Date Received:** 10/27/93 Injection Volume: 1.0 (uL) Date Extracted: 02/01/94 Dilution Factor: 1.0 02/18/94 Date Analyzed: Sulfur Clean-up: N (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)		
12674-11-2	Aroclor-1016	0.050	_ U	
11104-28-2	Aroclor-1221	0.050	U	
11141-16-5	Aroclor-1232	0.050	U	
53469-21-9	Aroclor-1242	0.050	U	
12672-29-6	Aroclor-1248	0.24		
11097-69-1	Aroclor-1254	0.35		
11096-82-5	Aroclor-1260	0.050	U	

EPA SAMPLE NO.

K46014 Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 39990 Phase Type: **BIOTA** Lab Sample ID: 202399 Phase Weight: 10.0 Date Received: **(g)** 10/27/93 Injection Volume: 1.0 (uL) Date Extracted: 02/01/94 Dilution Factor: 1.0 Date Analyzed: 02/19/94 Sulfur Clean-up: N (Y/N)

> CAS NO. COMPOUND **CONCENTRATION** Q (mg/Kg) 12674-11-2 Aroclor-1016 0.050 U J 11104-28-2 Aroclor-1221 0.050 UJ 11141-16-5 Aroclor-1232 U ブ 0.050 53469-21-9 Aroclor-1242 0.050 UT 12672-29-6 Aroclor-1248 0.050 UJ 11097-69-1 Aroclor-1254 0.13 J 11096-82-5 05 Aroclor-1260 0.050

PERCENT LIPID RESULTS

Percent Lipid Results

Sample ID	ample ID Lab ID		Results	
K46000	200345 earthworm		1.28%	
K46001	200346	earthworm	1.27%	
K46002	200347	earthworm	1.34%	
K46003	201526	earthworm	1.75%	
K46004	201527	earthworm	1.95%	
K46005	201528	earthworm	1.77%	
K46006	201529	earthworm	2.28%	
K46007	202392	earthworm	1.61%	
K46008	202393 earthworm		1.98%	
K46009	202394 earthworm		1.31%	
K46010	202395 earthworm		NA	
K46011	202396 earthworm		1.87%	
K46012	202397 earthworm		1.75%	
K46013	202398	earthworm	1.96%	
K46014	202399	earthworm	2.50%	

NA Data not available due to laboratory accident

PERCENT LIPID RESULTS

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 40009

PCB, PESTICIDE AND MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc. Colchester, Vermont

Review performed by: *

Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40009 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

					Analy	rsie .
Sample ID	Lab ID	Species	Description	Sample Location	Past/PCB/ Ng	Milpid
K40248F	216198	bass	fillet	Battle Creek	x	×
K40248R	216199	bass	carcass	Battle Creek		×
K40249F	216200	bass	fillet	Battle Creek	x	×
K40249R	216201	bass	CATCASS	Battle Creek		×
K40252F	216202	bass	fillet	Otsego City Dam	х.	х
K40252R	216203	bass	carcass	Otsego City Dam		x
K40253F	216204	bass	fillet	Otsego City Dam	×	x
K40253R	216205	bass	Carcass	Otsego City Dam		x
K40254F	216206	bass	fillet	Otsego City Dam	×	x
K40254R	216207	bass	carcass	Otsego City Dam		x
K40255F	216208	bass	fillet	Otsego City Dam	×	x
K40255R	216209	bass	carcass	Otsego City Dam		x
K40256F	216210	bass	fillet	Otsego City Dam	x	x
K40256R	216211	bass	CAICASS	Otsego City Dam		x
K40257F	216212	bass	fillet	Otsego City Dam	x	x
K40257A	216213	bass	carcass	Otsago City Dam		x
K40276F	216214	bass	fillet	Otsego Dam	×	x
K40276R	216215	bass	carcass	Otsego Dam		x
K40277F	216216	bass	fillet	Otsego Dam	x	×
K40277R	216217	bass	carcass	Otsego Dam		x
K40278F	216218	bass	fillet	Otsego Dam	x	x
K40278R	216219	bass	carcass	Otsego Dam		x
K40279F	216220	bass	fillet	Otsego Dam	x	×
K40279R	216221	bass	carcass	Otsego Dam		×
K40280F	216222	bass	fillet	Otsego Dam	x	x
K40280R	216223	bass	carcass	Otsego Dam		×
K40281F	216224	bass	fillet	Otsego Dam	x	x
K40281R	216225	bass	Calcass	Otsego Dam		×

					Analy	Analysis	
Sample: ID	Sample ID Lab ID 5	Species	Description	Sample Location	Pest/PC8/ Hg	%Lipid	
K40282F	216226	bass	fillet	Otsego Dam	x	×	
K40282R	216227	bass	CAICASS	Otsego Dam		x	
K40287F	216228	bass	fillet	Otsego Dam	x	x	
K40287R	216229	bass	CAICASS	Otsego Dam		×	
K40288F	216230	bass	fillet	Otsego Dam	×	×	
K40288R	216231	bass	CRICASS	Otsego Dam		×	
K40289F	216232	bass	fillet	Otsego Dam	x	x	
K40289R	216233	bass	CAICA\$8	Otsego Dam		x	
K40290F	216234	bass	fillet	Otsego Dam	x	x	
K40290R	216235	bass	carcass	Otsego Dam		x	
K40302F*	216236	bass	fillet	Trowbridge	x	×	
K40302R	216237	bass	carcass	Trowbridge		x	

MS/MSD/DUP performed on sample

PCB ANALYSES

<u>Introduction</u>

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Are the outliers correctly marked with an asterisk?			X
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?		<u> x</u>	
If yes, were the samples reanalyzed?			x
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
0_ out of2			
Blanks			
is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	×		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		x	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> </u>		
Aroclor 1221	<u>X</u>		
Aroclor 1232	x		
Aroclor 1242	<u> </u>		
Aroclor 1248	X		
Aroclor 1254	X		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	x		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	x		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X	-	

PCB Data Review Checklist - Page 3

	YES	NO	NA
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	x		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
is both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Lis	mits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		×	
Field Duplicates		<u>-</u>	
Where field duplicates submitted with the samples?		x	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	- Column 1	Surrogates	- Column 2
		TCX	DCB	TCX	DCB
K40248F	OK for all	ок	ок	ок	ок
K40249F	samples				
K40252F					·
K40253F					
K40254F					
K40255F					
K40256F					
K40257F					
K40276F					
K40277F					
K40278F					
K40279F					
K40280F					
K40281F					
K40282F					
K40287F					
K40288F					
K40289F					
K40290F					
K40302F					
K40302FMS					
K40302FMSD					

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl Qualifiers:

Surrogates diluted out D

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2087</u> Column: <u>RTX-35 / RTX-5</u>

Date:	5/8/94 2109	6/11	. 5/11	5/11	5/11	5/12	5/18
Time:	to: 5/9/94-1730	1027	1103	2106	2142	0463.	0529
1	initial Cal.	Cont Cal	Cont. Cal.	Cont. Cal.	Cont. Cal	Cont. Celi	. Cont. Es
	*RSD	% D	% D	% D	% D	% 0	% D
Aroclor 1016	5.0 / 4.7				1.0		
Arocior 1221	3.8 / 2.8						
Aroclor 1232	3.0 / 2.7						
Aroclor 1242	3.7 / 2.9						2.0
Aroclor 1248	3.6 / 3.1	7.5		5.0		2.0	
Aroclor 1254	9.3 / 8.9						
Aroclor 1260	3.0 / 3.0		6.0				
Tetrachioro-m-xylene	4.9 / 3.1						
Decachlorobiphenyl	8.1 / 11.8						
Affected Samples:							
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PCB Calibration Summary - Page 2

Instrument: HP2087 Column: RTX-35 / RTX-5

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Date:		5/12	5/12	5/12	5/12		
Time:		1240	1816	- 1728	1804		
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cent. Cal.	Cont. Call.	Cont. Cal.	Cont.
,	WRSD	X D	SD	%D	%0	SAD.	%D
Arocior 1016							
Aroclor 1221			 				
Aroclor 1232							
Arocior 1242							
Aroclor 1248		3.5		7.0			
Aroclor 1254			11.0				
Aroclor 1260					2.0		
Tetrachioro-m-xylene							
Decachlorobiphenyl					_		
Affected Samples:							
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}							

PCB Calibration Summary - Page 3

Instrument: <u>HP2087</u> Column: <u>RTX-35 / RTX-5</u>

Date:	5/18/94 1800	5/19	5/19	5/19	5/19	5/20	5/20
Time:	to 5/19/94 1:254	1607	1640	2820	2358	0834	0768
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont Cali	Cont. Cal.	ë 3
	*RSD	% D	%D	SED	% D	X D	34.0
Arocior 1016	3.9 / 4.3		11.0				
Aroclor 1221	4.6 / 5.5			_			
Aroclor 1232	2.9 / 3.2						
Arocior 1242	3.6 / 3.3				1.5	•	
Aroclor 1248	3.1 / 3.0	1.5		0.5		4.5	
Aroclor 1254	3.0 / 3.0						4.0
Aroclor 1260	3.2 / 2.3						
Tetrachioro-m-xylene	7.7 / 5.0						
Decachiorobiphenyl	7.2 / 8.8						
Affected Samples:							
					-		
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CORRECTED ANALYSIS SUMMARY FORMS

Lab Name:

Contract:

Phase Type:

Phase Weight:

Dilution Factor:

Injection Volume:

Aquatec, Inc.

91082

BIOTA

10.0

1.0

1.0

(g)

EPA SAMPLE NO. K40248F Lab Code: **IAUDA** SDG: 40009 Case: BIO Lab Sample ID: 216198 **Date Received:** 10/12/93 (uL) Date Extracted: 04/10/94

Date Analyzed:

(Y/N) Sulfur Clean-up: N

05/12/94

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	ι
11104-28-2	Aroclor-1221	0.050	
11141-16-5	Aroclor-1232	0.050	(
53469-21-9	Aroclor-1242	0.050	·
12672-29-6	Aroclor-1248	0.050	
11097-69-1	Aroclor-1254	0.079	
11096-82-5	Aroclor-1260	0.027	

EPA SAMPLE NO.

K40249F

Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 · Contract: Case: BIO SDG: 40009

BIOTA Lab Sample ID: Phase Type: 216200 10.0 Phase Weight: **Date Received:** 10/12/93 (g) (uL) Injection Volume: 1.0 Date Extracted: 04/10/94 Dilution Factor: 1.0 Date Analyzed: 05/12/94 Sulfur Clean-up: (Y/N)

> CAS NO. CONCENTRATION COMPOUND Q (mg/Kg) 12674-11-2 Aroclor-1016 0.050 U U 11104-28-2 Arocior-1221 0.050 11141-16-5 0.050 U Aroclor-1232 53469-21-9 Aroclor-1242 0.050 U Aroclor-1248 12672-29-6 0.050 U 11097-69-1 Aroclor-1254 0.092 11096-82-5 Aroclor-1260 0.039 J

EPA SAMPLE NO.

K40252F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 40009

Lab Sample ID: Phase Type: **BIOTA** 216202 Phase Weight: 10.0 (g) Date Received: 10/13/93 1.0 Injection Volume: (uL) **Date Extracted:** 04/10/94 1.0 Dilution Factor: Date Analyzed: 05/11/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	ι
11104-28-2	Arocior-1221	0.050	ι
11141-16-5	Aroclor-1232	0.050	į
53469-21-9	Aroclor-1242	0.050	į
12672-29-6	Aroclor-1248	0.050	Į
11097-69-1	Aroclor-1254	0.26	
11096-82-5	Aroclor-1260	0.059	

EPA SAMPLE NO. K40253F Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 Case: BIO SDG: 40009 Contract: Phase Type: **BIOTA** Lab Sample ID: 216204 Phase Weight: 10.0 (g) Date Received: 10/13/93 Injection Volume: 1.0 (uL) **Date Extracted:** 04/10/94 5.0 Dilution Factor: Date Analyzed: 05/11/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.86	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	· U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.4	
11096-82-5	Aroclor-1260	0.40	

EPA SAMPLE NO. K40254F Lab Name: Aquatec, Inc. Lab Code: **AQUAI** Contract: 91082 Case: BIO SDG: 40009 Phase Type: **BIOTA** Lab Sample ID: 216206 Phase Weight: 10.0 **Date Received:** 10/13/93 **(g)** Injection Volume: 04/10/94 1.0 (uL) **Date Extracted:** Dilution Factor: _ 1.0 Date Analyzed: 05/11/94 Sulfur Clean-up: Υ (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.57	
11096-82-5	Aroclor-1260	0.17	

EPA SAMPLE NO. K40255F Lab Name: Aquatec, Inc. IAUDA Lab Code: 91082 BIO 40009 Contract: Case: SDG: Phase Type: **BIOTA** Lab Sample ID: 216208 Phase Weight: 10.0 **Date Received:** 10/13/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 04/10/94 Dilution Factor: 1.0 Date Analyzed: 05/11/94

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	C
12674-11-2	Aroclor-1016	0.050	Ĺ
11104-28-2	Arocior-1221	0.050	L
11141-16-5	Aroclor-1232	0.050	l
53469-21-9	Aroclor-1242	0.050	
12672-29-6	Aroclor-1248	0.050	ί
11097-69-1	Aroclor-1254	0.48	
11096-82-5	Aroclor-1260	0.11	

Sulfur Clean-up:

Ν

(Y/N)

EPA SAMPLE NO. K40256F Lab Name: Aquatec, Inc. Lab Code: **AQUAI** · Contract: 91082 Case: BIO SDG: 40009 Phase Type: **BIOTA** Lab Sample ID: 216210 10.0 10/13/93 Phase Weight: **Date Received: (g)** Injection Volume: 1.0 (uL) Date Extracted: 04/10/94 Dilution Factor: 1.0 Date Analyzed: 05/11/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.088	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.21	
11096-82-5	Aroclor-1260	0.061	

EPA SAMPLE NO. K40257F Lab Name: Aquatec, Inc. Lab Code: AQUAI Case: Contract: 91082 BIO SDG: 40009 Phase Type: **BIOTA** Lab Sample ID: 216212 Phase Weight: 10.0 **Date Received:** 10/13/93 (g) Injection Volume: 1.0 (uL) **Date Extracted:** 04/10/94 Dilution Factor: 1.0 Date Analyzed: 05/11/94 Sulfur Clean-up: N_ (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	C
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	· U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.71	-
11096-82-5	Aroclor-1260	0.19	

EPA SAMPLE NO. K40276F Lab Name: Aquatec, Inc. Lab Code: **AQUAI** . Contract: 91082 Case: BIO SDG: 40009 Phase Type: BIOTA Lab Sample ID: 216214 Phase Weight: 10.0 (g) Date Received: 10/13/93 Injection Volume: 1.0 (uL) Date Extracted: 04/10/94 Dilution Factor: 2.0 Date Analyzed: 05/12/94

COMPOUND	CONCENTRATION (mg/Kg)	<u>a</u>
Aroclor-1016	0.55	
Aroclor-1221	0.10	U
Aroclor-1232	0.10	U
Aroclor-1242	0.10	U
Aroclor-1248	0.10	U
Aroclor-1254	0.98	
Aroclor-1260	0.15	
	Aroclor-1221 Aroclor-1232 Aroclor-1242 Aroclor-1248 Aroclor-1254	Aroclor-1016 0.55 Aroclor-1221 0.10 Aroclor-1232 0.10 Aroclor-1242 0.10 Aroclor-1248 0.10 Aroclor-1254 0.98

Sulfur Clean-up:

N

(Y/N)

EPA SAMPLE NO. K40277F Lab Name: Aquatec, Inc. Lab Code: **IAUDA** Contract: 91082 Case: BIO SDG: 40009 **BIOTA** Lab Sample ID: 216216 Phase Type: 10.0 Phase Weight: **Date Received:** 10/13/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 04/10/94 2.0 Date Analyzed: Dilution Factor: 05/12/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.68	
11104-28-2	Aroclor-1221	0.10	Ų
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.10	U

Lab Name: Aquatec, Inc.

' Contract:

91082

EPA SAMPLE NO.

216218 Phase Type: **BIOTA** Lab Sample ID: 10.0 Phase Weight: 10/13/93 (g) **Date Received:** Injection Volume: 1.0 (uL) Date Extracted: 04/10/94 2.0 Date Analyzed: 05/12/94 Dilution Factor: _ Sulfur Clean-up: N

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	C
12674-11-2	Aroclor-1016	0.65	
11104-28-2	Aroclor-1221	0.10	L
11141-16-5	Aroclor-1232	0.10	ι
53469-21-9	Aroclor-1242	0.10	į
12672-29-6	Aroclor-1248	0.10	l
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.10	ι

EPA SAMPLE NO. K40279F Lab Name: Aquatec, Inc. Lab Code: **AQUAI** Case: Contract: 91082 BIO SDG: 40009 Phase Type: _ **BIOTA** Lab Sample ID: 216220 Phase Weight: 10.0 Date Received: (g) 10/13/93 Injection Volume: 1.0 (uL) Date Extracted: 04/10/94 Dilution Factor: __ 1.0 Date Analyzed: 05/12/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.31	
11097-69-1	Aroclor-1254	0.17	
11096-82-5	Aroclor-1260	0.055	

EPA SAMPLE NO. K40280F Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 40009 Contract: Case: BIO SDG: Phase Type: **BIOTA** Lab Sample ID: 216222 Phase Weight: 10.0 Date Received: (g) 10/13/93 Injection Volume: 1.0 (uL) 04/10/94 **Date Extracted:** Dilution Factor: 10.0 Date Analyzed: 05/12/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Arocior-1242	0.50	Ų
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	3.4	
11096-82-5	Aroclor-1260	0.33	J

EPA SAMPLE NO.

K40281F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 40009

Phase Type: BIOTA Lab Sample ID: 216224 Phase Weight: 10.0 Date Received: 10/13/93 (g) 1.0 Injection Volume: (uL) Date Extracted: 04/10/94 1.0 Dilution Factor: Date Analyzed: 05/12/94 N Sulfur Clean-up: (Y/N)

> CAS NO. COMPOUND CONCENTRATION Q (mg/Kg) 12674-11-2 Aroclor-1016 0.57 11104-28-2 Aroclor-1221 0.050 U 11141-16-5 Aroclor-1232 0.050 U 53469-21-9 Aroclor-1242 0.050 U 12672-29-6 Aroclor-1248 0.45 11097-69-1 Aroclor-1254 0.40 11096-82-5 Aroclor-1260 0.050 U

2.0

Dilution Factor:

EPA SAMPLE NO.

K40282F Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 SDG:_ 40009 Case: BIO Phase Type: **BIOTA** Lab Sample ID: 216226 Phase Weight: 10.0 10/13/93 (g) **Date Received:** Injection Volume: 1.0 (uL) Date Extracted: 04/10/94

Sulfur Clean-up: N (Y/N)

Date Analyzed:

05/12/94

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.54	
11104-28-2	Aroclor-1221	0.10	Ų
11141-16-5	Arocior-1232	0.10	Ĺ
53469-21-9	Aroclor-1242	0.10	į
12672-29-6	Aroclor-1248	0.10	ί
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.14	

EPA SAMPLE NO. K40287F Lab Name: Lab Code: Aquatec, Inc. AQUAI Contract: 91082 Case: BIO SDG: 40009 Phase Type: 216228 **BIOTA** Lab Sample ID: 10/14/93 Phase Weight: 10.0 (g) Date Received: Injection Volume: 1.0 (uL) Date Extracted: 04/10/94 Dilution Factor: 1.0 Date Analyzed: 05/12/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Arocior-1016	0.071	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.26	
11096-82-5	Aroclor-1260	0.059	

EPA SAMPLE NO.

K40288F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

Contract: 91082 Case: BIO SDG: 40009

Phase Type: **BIOTA** Lab Sample ID: 216230 Phase Weight: 10.0 (g) Date Received: 10/14/93 1.0 Injection Volume: __ (uL) Date Extracted: 04/10/94 2.0 Dilution Factor: Date Analyzed: 05/12/94 Sulfur Clean-up: N (Y/N)

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CAS NO. COMPOUND CONCENTRATION Q (mg/Kg) 12674-11-2 Aroclor-1016 0.25 U 11104-28-2 Aroclor-1221 0.10 U 11141-16-5 Aroclor-1232 0.10 53469-21-9 Aroclor-1242 0.10 U 12672-29-6 Aroclor-1248 U 0.10 11097-69-1 Aroclor-1254 0.86 11096-82-5 Aroclor-1260 0.093 J

EPA SAMPLE NO. K40289F Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 Contract: Case: BIO SDG: 40009 Phase Type: **BIOTA** Lab Sample ID: 216232 Phase Weight: 10.0 Date Received: 10/14/93 (g) Injection Volume: _ 1.0 04/10/94 (uL) **Date Extracted:** Dilution Factor: 1.0 Date Analyzed: 05/12/94 Sulfur Clean-up: Ν (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	i
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.41	
11096-82-5	Aroclor-1260	0.061	

EPA SAMPLE NO.

K40290F Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 · Contract: Case: BIO SDG: 40009 **BIOTA** Lab Sample ID: Phase Type: 216234 Phase Weight: 10.0 (g) **Date Received:** 10/14/93 Injection Volume: 1.0 (uL) **Date Extracted:** 04/10/94 Dilution Factor: 1.0 Date Analyzed: 05/12/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.62	,
11097-69-1	Aroclor-1254	0.34	
11096-82-5	Aroclor-1260	0.11	

EPA SAMPLE NO. K40302F Lab Code: Lab Name: Aquatec, Inc. IAUDA 91082 SDG: 40009 Contract: Case: BIO Phase Type: **BIOTA** Lab Sample ID: 216236 10.0 Phase Weight: (g) **Date Received:** 10/14/93 Injection Volume: 1.0 Date Extracted: 04/10/94 (uL) 2.0 Dilution Factor: Date Analyzed: 05/19/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	٥
12674-11-2	Aroclor-1016	0.44	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.13	

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. All samples were originally analyzed within the specified holding time. Dilutions for samples K40252F, K40254F and K40255F were, however, analyzed over the specified holding times. All data for the dilutions have been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exception:

Instrument HP2404 - RTX5 5/20/94 01:18

2-Bromobiphenyl

55.4%

Data for this compound in samples K40302FMSD and K40302FMSD have been qualified as estimated based on the deviation.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40253F	Aldrin	49.5%
K40254F	Aldrin	75.5%
K40255F	Aldrin 4,4'-DDT	98.1% 39.0%
K40255FDL	4,4'-DDT	45.9%
K40256F	Aldrin Heptachlor Epoxide 4,4'-DDT	43.7% 383.0% 49.5%
K40257F	Aldrin 4,4'-DDT	75.0% 473.1%
K40276F	Aldrin gamma-Chlordane 4,4'-DDT	49.5% 157.3% 478.0%

K40277F	Aldrin gamma-Chlordane 4,4'-DDE 4,4'-DDT	54.1% 158.4% 26.7% 406.2%
K40278F	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDT	46.4% 27.7% 164.0% 98.7%
K40279F	Aldrin Heptachlor Epoxide 4,4'-DDE	74.1% 42.9% 28.0%
K40280F	Aldrin gamma-Chlordane 4,4'-DDT	113.5% 227.8% 415.9%
K40281F	Aldrin gamma-Chlordane 4,4'-DDT	38.7% 187.3% 169.8%
K40282F	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDT	94.4% 189.7% 321.8% 216.7%
K40288F	Aldrin gamma-Chlordane 4,4'-DDT	56.5% 134.5% 281.3%
K40289F	Aldrin 4,4'-DDE	55.9% 25.6%
K40290F	Aldrin 4,4'-DDE	80.5% 29.0%
K40302F	Aldrin gamma-Chlordane 4,4'-DDE 4,4'-DDT	50.8% 110.2% 28.0% 532.5%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries of Aldrin were above the specified control limit in both the matrix spike and matrix spike duplicate samples. The high recoveries can be attributed to positive interference from PCBs present in the matrix spike. All other recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. Matrix spike recoveries were with acceptable control limits for the matrix spike blank (MSB) sample. No qualifiers have been added to the samples based on matrix spike performance.

8. General Comments

The recommended data usage for the sample dilutions is as follows:

K40252F and K40252FDL

The data from sample K40252F should be used for all compounds except 4,4'-DDE. The data from the dilution K40252FDL should be used for 4,4'-DDE only.

K40254F and K40254FDL

The data from sample K40254F should be used for all compounds except 4,4'-DDE. The data from the dilution K40254FDL should be used for 4,4'-DDE only.

K40255F and K40255FDL

The data from sample K40255F should be used for all compounds except 4,4'-DDE and Aldrin. The data from the dilution K40255FDL should be used for 4,4'-DDE and Aldrin only.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?	X		
Surrogate Recovery			
Are the surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Are the outliers correctly marked with an asterisk?			X
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?		<u> </u>	
If yes, were the samples reanalyzed?			X
Were the method blanks reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
is the method blank summary form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		x	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		x	
Calibration and GC Performance			
Are the following chromatograms and data printouts presblanks, and MS/MSD?	sent for a	all samples	•
peak resolution check	<u> </u>		
performance evaluation mixtures (BCS)	<u> </u>		
Toxaphene multipoint calibration	<u> </u>		
Pesticide/PBB multipoint calibration	<u> </u>		
Pesticide/PBB mid-point standard	<u> </u>		
instrument blanks	X		
Are Forms Vi 1-4 present and complete for each column and analytical sequence?	x		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	x		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?		X	
Is Form VII-2 present and complete for each mid-point standard analyzed?	×		
Are RPD values for all compounds < 25%?	×		
Analytical Sequence Check			

Pesticide/PCB Data Validation Checklist - Page 3

NO	NA
	X
	X
	X
X	
X	
	· · · · ·
X	
<u> </u>	
	<u> </u>

Pesticide/PBB Qualifier Summary Holding Time and Surrogates

Sample ID	Holding	Surrogates	- Column 1	Surrogates	- Column 2
	Time	TCX	DCB	TCX	DCB
K40248F	OK for all	ок	OK .	ок	ОК
K40249F	samples				
K40252F					
K40252FDL					
K40253F			<u> </u>		
K40254F					
K40254FDL					
K40291WMSD	· · · · · · · · · · · · · · · · · · ·				
K40292W					
K40255F					
K40255FDL					
K40256F					
K40257F					
K40276F					
K40277F					
K40278F					
K40279F					
K40280F					
K40281F					
K40282F					
K40287F					
K40288F					
K40289F				ĸ.	
K40290F					
K40302F					
K40302FMS					
K40302FMSD					

Surrogates:

TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

Surrogate diluted out Recovery high D

Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: <u>HP2404</u>
Column: <u>RTX-5</u>

Date:	5/17/94	5/18	5/19	5/19	5/19	5/20	5/24
Time:	17:19	15:56	90:16	08:36	16:57	01:18	09:01
	initial Cal.	Cont. Cal.	Cont. (Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	% ASD	%D	% D	% D	% D	% D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok	ok	55.4
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachiorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chiordane	· !						
alpha-Chlordane							
trans-Nonachior		-					
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT		:	 				
Hexabromobiphenyl (BP-6)		-		<u> </u>		<u>.</u>	
Toxaphene							
Tetrachloro-m-xylene				<u></u>	•	<u> </u>	<u> </u>
Decachlorobiphenyl							
Affected Samples:							K40302F MSD
							MSB
	•						
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Pesticide/PBB Calibration Summary - Page 2

Instrument: <u>HP2404</u>
Column: <u>RTX-5</u>

Date:		5/25					
Time:		00:48					
	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cons. Cat.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	%D	%D	%D	%D
2-Bromobiphenyl		ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chiordane							
trans-Nonachior							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene		•					
Tetrachloro-m-xylene					S to		
Decachlorobiphenyl							
Affected Samples:							
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						1	1
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ř					 		

Pesticide/PBB Calibration Summary - Page 3

Instrument: <u>HP2404</u> Column: <u>RTX-35</u>

Date:	5/17/94	5/18	5/19	5/19	5/19	5/20	5/24
Time;	17:19	15:56	00:16	08:36	16:57	01:18	09:01
1	Initial Cal	Cont. Cal.	Cont. Cal.	Cont. Gal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	% D	%D	% D	% D	% D	%D
2-Bromobiphenyl	ok	ok	ok	ok	ok	ok	ok
3-Bromobiphenyl		<u></u>				ļ	
4-Bromobiphenyl							
Hexachlorobenzene		·					<u> </u>
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide				_			
gamma-Chlordane							
alpha-Chlordane				-			
trans-Nonachlor				-			
4,4'-DDE							
Dieldrin							
4,4'-DDD				_			
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachioro-m-xylene					C a		
Decachlorobiphenyl							
Affected Samples:							K40302I MSD
							мѕв
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Pesticide/PBB Calibration Summary - Page 4

Instrument: <u>HP2404</u> Column: <u>RTX-35</u>

Date:		5/25					
Time:		90:48					
	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	% D	%D	% D	X D	% D	% D
2-Bromobiphenyl		ok					
3-Bromobiphenyl							
4-Bromobiphenyl						. ==	
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)]					l
Toxaphene							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							
{							
Ī							

Corrected Sample Analysis Data Sheets

Soxhlet

1.0

Extraction:

Dilution Factor:

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Client ID No. K40248F Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40009 Lab Sample ID: 216198 Phase Type: **Biota Date Received:** 10/12/93 Phase Weight: 10.0 Date Extracted: 04/10/94 g

Date Analyzed:

Sulfur Clean-up:

05/19/94

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.018	
60-57-1	Dieldrin	0.010	υ
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.
K40249F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 216200

Date Received: 10/12/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	Ü
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.022	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

 Lab Name:
 Aquatec, Inc.
 K40252F

 Lab Code:
 AQUAI
 SDG:
 40009

 Case:
 BIO
 SDG:
 40009

 Lab Sample ID:
 216202

 hase Type:
 Biota
 Date Received:
 10/13/93

Client ID No.

04/10/94

05/18/94

Phase Type:BiotaDate Received:Phase Weight:10.0 gDate Extracted:Extraction:SoxhletDate Analyzed:Dilution Factor:1.0Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0052	
39765-80-5	trans-Nonachlor	0.011	
72-55-9	4,4'-DDE	0.30 0.17	*DJ
60-57-1	Dieldrin	0.041	
72-54-8	4,4'-DDD	0.081	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.068	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40253F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 4.0

 Lab Sample ID:
 216204

 Date Received:
 10/13/93

 Date Extracted:
 04/10/94

 Date Analyzed:
 05/18/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.040	U	
2113-57-7	3-Bromobiphenyl	0.040	U	
92-66-0	4-Bromobiphenyl	0.040	U	
118-74-1	Hexachlorobenzene	0.020	U	
58-89-9	gamma-BHC	0.020	U	
309-00-2	Aldrin	0.066	5	
1024-57-3	Heptachlor Epoxide	0.056		
5103-74-2	gamma-Chlordane	0.024		·f
5103-71-9	alpha-Chlordane	0.020	U	·
39765-80-5	trans-Nonachlor	0.020	U	
72-55-9	4,4'-DDE	0.14		
60-57-1	Dieldrin	0.040	U	
72-54-8	4,4'-DDD	0.040	U	
5103-73-1	cis-Nonachlor	0.020	U	
50-29-3	4,4'-DDT	0.040	U	
36355-01-8	Hexabromobiphenyl	0.080	U	
8001-35-2	Toxaphene	0.80	U	

 Lab Name:
 Aquatec, Inc.
 K40254F

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40009

 Lab Sample ID:
 216206

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID:	216206
Date Received:	10/13/93
Date Extracted:	04/10/94
Date Analyzed:	05/19/94
Sulfur Clean-up:	N

Client ID No.

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0053	JN
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chiordane	0.0060	
39765-80-5	trans-Nonachior	0.020	
72-55-9	4,4'-DDE	0,17 -0.30-	× D2
60-57-1	Dieldrin	0.073	
72-54-8	4,4'-DDD	0.12	
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.11	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

 Lab Name:
 Aquatec, Inc.
 K40255F

 Lab Code:
 AQUAI
 K40255F

 Contract:
 91082
 SDG:
 40009

 Case:
 BIO
 SDG:
 40009

 Chase Type:
 Biota
 Date Received:
 10/13/93

Client ID No.

04/10/94

05/19/94

N

Phase Type:BiotaDate Received:Phase Weight:10.0 gDate Extracted:Extraction:SoxhletDate Analyzed:Dilution Factor:1.0Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0,010 0.0053	UD
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.18 -0.16-	₹ DJ
60-57-1	Dieldrin	0.011	
72-54-8	4,4'-DDD	0.037	
5103-73-1	cis-Nonachior	0.0050	U
50-29-3	4,4'-DDT	0.042	7
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.
K40256F

SDG: 40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 216210

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.0071	4	
1024 57 3	Heptachlor Epoxide	0.0053		-R
5103-74-2	gamma-Chlordane	0.0050	U	•
5103-71-9	aipha-Chiordane	0.0050	U	
39765-80-5	trans-Nonachior	0.0050	U	
72-55-9	4,4'-DDE	0.076		
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.020		
5103-73-1	cis-Nonachlor	0.0050	U	
50-29-3	4,4'-DDT	0.020	4	i
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

1

Client ID No. K40257F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 216212

 Date Received:
 10/13/93

 Date Extracted:
 04/10/94

 Date Analyzed:
 05/19/94

 Sulfur Clean-up:
 N

				_
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	ĺ
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	l
118-74-1	Hexachlorobenzene	0.0050	ี่ป	
58-89-9	gamma-BHC	0.0050	U	1
309-00-2	Aldrin	0.010	JN	
1024-57-3	Heptachlor Epoxide	0.0084		l
5103-74-2	gamma-Chlordane	0.0050	U	
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.042		
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.010	U	
5103-73-1	cis-Nonachlor	0.0050	υ	
50 29 3	-4,4' DDT	0.012		I-R
36355-01-8	Hexabromobiphenyl	0.020	U]
8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc. K40276F

Lab Code: AQUAI

Contract: 91082

Case: BIO SDG: 40009

Lab Sample ID: 216214

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 216214

 Date Received:
 10/13/93

 Date Extracted:
 04/10/94

 Date Analyzed:
 05/19/94

 Sulfur Clean-up:
 N

Client ID No.

_					
	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
	2052-07-5	2-Bromobiphenyl	0.010	U	
	2113-57-7	3-Bromobiphenyl	0.010	U	
Г	92-66-0	4-Bromobiphenyl	0.010	U	l
	118-74-1	Hexachlorobenzene	0.0050	U	Í
	58-89-9	gamma-BHC	0.0050	U	
	309-00-2	Aldrin	0.028	4	İ
	1024-57-3	Heptachlor Epoxide	0.024		
Ε	5103-74-2	gamma Chlordane	0.0089		R
	5103-71-9	alpha-Chlordane	0.0050	U	1
	39765-80-5	trans-Nonachlor	0.0050	U	ĺ
	72-55-9	4,4'-DDE	0.051		
	60-57-1	Dieldrin	0.010	U	
	72-54-8	4,4'-DDD	0.014		
	5103-73-1	cis-Nonachior	0.0050	U	
E	50-29-3	4,4'-DDT	0.015		R
	36355-01-8	Hexabromobiphenyl	0.020	U	
	8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Dilution Factor:

Client ID No.
K40277F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

1.0

 Lab Sample ID:
 216216

 Date Received:
 10/13/93

 Date Extracted:
 04/10/94

SDG:

Date Analyzed: Sulfur Clean-up:

05/19/94 N

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CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	ĺ
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.029	JN	
1024-57-3	Heptachlor Epoxide	0.025		
5103 74 2	gamma Chlordane	0.0089		R
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachior	0.0050	U	
72-55-9	4,4'-DDE	0.043	7	1
60-57-1	Dieldrin	0.010	U	1
72-54-8	4,4'-DDD	0.013		1
5103-73-1	cis-Nonachlor	0.0050	U	1
50-29-3	4,4'-DDT	0.013		I R
36355-01-8	Hexabromobiphenyl	0.020	U	1
8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40278F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 216218

 Date Received:
 10/13/93

 Date Extracted:
 04/10/94

 Date Analyzed:
 05/19/94

 Sulfur Clean-up:
 N

- T					i
	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
	2052-07-5	2-Bromobiphenyl	0.010	U	
	2113-57-7	3-Bromobiphenyl	0.010	U	
	92-66-0	4-Bromobiphenyl	0.010	U	
	118-74-1	Hexachiorobenzene	0.0050	U	i
	58-89-9	gamma-BHC	0.0050	U	
	309-00-2	Aldrin	0.026	J	l
	1024-57-3	Heptachlor Epoxide	0.026	7	
	5103-74-2	gamma Chlordane	0.0086		R
	5103-71-9	alpha-Chiordane	0.0058		
	39765-80-5	trans-Nonachlor	0.0050	U	İ
	72-55-9	4,4'-DDE	0.093		
	60-57-1	Dieldrin	0.011		
	72-54-8	4,4'-DDD	0.033		
	5103-73-1	cis-Nonachlor	0.0050	U	
	50-29-3	4,4'-DDT	0.031		-R
Г	36355-01-8	Hexabromobiphenyl	0.020	U	1
Г	8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40279F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 216220

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U ⁻
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.011	אנ
1024-57-3	Heptachlor Epoxide	0.0098	7
5103-74-2	gamma-Chiordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.018	4
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.
K40280F

40009

Phase Type:

Phase Weight:

Extraction:

Dilution Factor:

Biota

10.0 g

Soxhlet

3.0

 Lab Sample ID:
 216222

 Date Received:
 10/13/93

 Date Extracted:
 04/10/94

 Date Analyzed:
 05/19/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.030	U	
2113-57-7	3-Bromobiphenyl	0.030	Ü	
92-66-0	4-Bromobiphenyl	0.030	U	
118-74-1	Hexachlorobenzene	0.015	U	
58-89-9	gamma-BHC	0.015	U	
309-00-2	Aldrin	0.053		-R
1024-57-3	Heptachlor Epoxide	0.078		
5103-74-2	gamma-Chlordane	0.025		-R
5103-71-9	alpha-Chlordane	0.015		
39765-80-5	trans-Nonachlor	0.015	U	
72-55-9	4,4'-DDE	0.16		
60-57-1	Dieldrin	0.030	U	
72-54-8	4,4'-DDD	0.036		
5103-73-1	cis-Nonachlor	0.015	U	
50 20 3	4,4'-DDT	0.049		-R
36355-01-8	Hexabromobiphenyl	0.060	U	`
8001-35-2	Toxaphene	0.60	U	

 Lab Name:
 Aquatec, Inc.
 K40281F

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40009

 Lab Sample ID:
 216224

 hase Type:
 Biota
 Date Received:
 10/13/93

Client ID No.

	•	Lab Sample IU:	216224
Phase Type:	Biota	Date Received:	10/13/93
Phase Weight:	10.0 g	Date Extracted:	04/10/94
Extraction:	Soxhlet	Date Analyzed:	05/19/94
Dilution Factor:	1.0	Sulfur Clean-up:	N

COMPOUND	CONCENTRATION (mg/Kg)	a	
3romobiphenyl	0.010	U	
Bromobiphenyl	0.010	υ	
Bromobiphenyl	0.010	U	
achlorobenzene	0.0050	U	
gamma-BHC	0.0050	U	
Aldrin	0.030	7	
tachlor Epoxide	0.027		
nma-Chlordane	0.0071		R
ha-Chlordane	0.0050	U	,
ns-Nonachior	0.0050	U	
4,4'-DDE	0.039		
Dieldrin	0.010	U	
4,4'-DDD	0.023		
is-Nonachlor	0.0050	υ	
4,4' DDT	0.013		l-R
abromobiphenyl	0.020	U	``
Toxaphene	0.20	U	
	tachlor Epoxide nma Chlordane pha-Chlordane nns-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDD is-Nonachlor 4,4'-DDT abromobiphenyl	(mg/Kg)	(mg/Kg)

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40282F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 2.0

Lab Sample ID: 216226

Date Received: 10/13/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

				_
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.020	U	1
2113-57-7	3-Bromobiphenyl	0.020	U	1
92-66-0	4-Bromobiphenyl	0.020	U	1
118-74-1	Hexachlorobenzene	0.010	U]
58-89-9	gamma-BHC	0.010	U]
309 00 2	Aldrin	0.028		I-R
1024-57-3	Heptachlor Epoxide	0.027		1 `
5103-74-2	gamma-Chlordane	-0.011		1R
5103-71-9	alpha-Chlordane	0.010	U	1
39765-80-5	trans Nonachior	0.011		IR.
72-55-9	4,4'-DDE	0.095		1
60-57-1	Dieldrin	0.020	U	1
72-54-8	4,4'-DDD	0.025 🛦		1
5103-73-1	cis-Nonachlor	0.017		1
50-29-3	4,4'-DDT	0.032		1R
36355-01-8	Hexabromobiphenyl	0.040	U	1 `
8001-35-2	Toxaphene	0.40	U]
				-

1.0

Dilution Factor:

Client ID No. Lab Name: K40287F Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40009 Lab Sample ID: 216228 Phase Type: **Biota Date Received:** 10/14/93 Phase Weight: 10.0 Date Extracted: 04/10/94 Extraction: 05/19/94 Soxhlet Date Analyzed:

Sulfur Clean-up:

N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	α
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	υ
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	Ü

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.
K40288F

40009

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 216230

Date Received: 10/14/93

Date Extracted: 04/10/94

Date Analyzed: 05/19/94

Sulfur Clean-up: N

				_
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	1
92-66-0	4-Bromobiphenyl	0.010	U	1
118-74-1	Hexachlorobenzene	0.0050	U	1
58-89-9	gamma-BHC	0.0050	U	1
309-00-2	Aldrin	0.016	MC	1
1024-57-3	Heptachlor Epoxide	0.013		
5103 74 2	gamma-Chlordane	0.0058		ŀR
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.050		
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.011 a	·	1
5103-73-1	cis-Nonachlor	0.0050	U	1
50-29-3	4,4' DDT	0.015		I-R
36355-01-8	Hexabromobiphenyl	0.020	U	1'`
8001-35-2	Toxaphene	0.20	U	1

Client ID No.

Lab Name: Aquatec, Inc.
Lab Code: AQUAI

Contract: 91082

Case: BIO SDG: 40009

Lab Sample ID: 216232

Phase Type: Biota Date Received: 10/14/93

Biota	
10.0 g	
Soxhlet	
1.0	
	10.0 g Soxhlet

Lab Sample ID:	216232	
Date Received:	10/14/93	
Date Extracted:	04/10/94	
Date Analyzed:	05/19/94	_
Sulfur Clean-up:	N	_
		_

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	υ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	. U
118-74-1	Hexachlorobenzene	0.0050	Ú
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.014	NC
1024-57-3	Heptachlor Epoxide	0.011	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.022	T
60-57-1	Dieldrin	0.010	Ú
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachior	0.0050 *	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, inc. Lab Code: AQUAI Contract: 91082 Case: BIO

Biota

Soxhlet

1.0

10.0

Phase Type:

Extraction:

Phase Weight:

Dilution Factor:

Client ID No. K40290F

40009

Lab Sample ID: 216234 **Date Received:** 10/14/93 **Date Extracted:** 04/10/94 Date Analyzed: 05/19/94

SDG:

Sul

ato minigatos.	00/10/1	, ,
ifur Clean-up:	N	

			,
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.017	NT
1024-57-3	Heptachlor Epoxide	0.018	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chiordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.027	17
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO SDG: 40009

Lab Sample ID: 216236

hase Type: Biota Date Received: 10/14/93

Client ID No.

Phase Type: Date Received: 10/14/93 **Biota** Phase Weight: 10.0 Date Extracted: 04/10/94 Extraction: Soxhlet Date Analyzed: 05/19/94 Sulfur Clean-up: Dilution Factor: 1.0 N

CAS NO.	COMPOUND	CONCENTRATION	Q
		(mg/Kg)	
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.026	JN
1024-57-3	Heptachlor Epoxide	0.023	
5103-74-2	gamma Chiordane	0.0088	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.042	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.011	
36355-01-8	Hexabromobiphenyi	0.020	U
8001-35-2	Toxaphene	0.20	U

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was below acceptable limits. All data have been qualified as estimated based on the deviation.

4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

	YES	NO	NA
Data Completeness and Deliverables			
is there a narrative or cover letter present?	<u> </u>		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		. X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	<u> </u>		<u> </u>
SDG No.?	<u>X</u>		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP .			X
Flame AA			X
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	×		
is the data properly labeled?	×		
Holding Times	***************************************		*********
Were mercury analyses performed within 28 days?	<u> </u>		

	YES	NO	NA
Were cyanide distillations performed within 14 days?			X
Were other metal analysis performed within 6 months?			X
Form I (Final Data)			
Are all forms complete?	X		
Are correct units indicated on Form I's?	X		
Are all "less than IDL" values properly coded with "U"?	X		
Are the correct concentration qualifiers used with final data?	X		
Was a brief physical description of samples given on Form I's?		X	
Calibration			
Is a record of at least 2 point calibration present for ICP analysis?			X
ls a record of 5 point calibration present for Hg analysis?	X		
ls a record of 4 point calibration present for:			
Flame AA?			X
Furnace AA?			X
Cyanides?			X
ls one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?			X
ls correlation coefficient less than .995 for:			
Mercury Analysis?	<u> </u>		
Cyanide Analysis?			X
Atomic Absorption Analysis?			X
Form II A (Initial and Continuing Calibration Verifica	ition)	·— - · ·—	
Present and complete for every metal and cyanide?	X		
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?			X
Hg (80-120 %R)?	X		
Cyanides (85-115 %R)?			X

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?		<u>.</u>	X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?		********	X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	<u>X</u>		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL <crdl) (crdls)?<="" contract="" detection="" equal="" less="" limits="" or="" required="" td="" than="" the="" to=""><td>X</td><td></td><td></td></crdl)>	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	·

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			X
Is concentration of prep. blank below the negative CRDL?		X	
Form IV (ICP Interference Check Sample)			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits (±20%)?			Х
If no, is concentration of AI, Ca, Fe, or Mg lower than the respective concentration in ICS?			×
Form V A (Spiked Sample Recovery - Pre-Digestion/P	re-Distil	lation)	
Present and complete for:			
each SDG?	<u> </u>		-
each matrix type?	x		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?		X	
If no, is sample concentration greater than or equal to four times spike concentration?		X	
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	X		
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?	X		
between 126-200%?		X	
greater than 200%?		X	
Form VI (Lab Duplicates)			
Present and complete for:			
each SDG?	X		•
•			

·	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	•
Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	×		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
ls any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		X	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
Form VII (Laboratory Control Sample)			
Was one LCS prepared and analyzed for:			
each SDG?	<u> </u>		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
ls LCS "Found" lower than the control limits on Form VII?		X	
Form IX (ICP Serial Dilution)			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E"" on Form I's and Form IX when initial concentration of Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:		-	
> 10%?			X
≥100%?			X
Furnace Atomic Absorption (AA) QC Analysis			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA?			X

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?			X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?			X
is analytical spike recovery outside the control limits (85-115%) for any sample?			X
Form VIII (Method of Standard Addition Results)		-	
Present?		X	
If no, is any Form I result coded with "S" or a "+"?		X	
Is coefficient of correlation for MSA less than 0.990 for any sample?			X
Was MSA required for any sample but not performed?		<u> </u>	
Is coefficient of correlation for MSA less than 0.995?			X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?			X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?			X
Field Blank			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?			X
If no, was field blank value already rejected due to other QC criteria?			×
Form X, XI, XII (Verification of Instrumental Paramet	ers)		
Is verification report present for :			
Instrument Detection Limits (quarterly)?	X		
ICP Interelement Correlation Factors (annually)?			X
ICP Linear Ranges (quarterly)?			×
Form X (Instrument Detection Limits)			
Are IDLs present for:			
all the analytes?	X		
all the instruments used?	X		

	YES	NO	NA
is IDL greater than CRDL for any analyte?		X	
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.			X
Was any sample result higher linear range of ICP.			X
Was any sample result higher than the highest calibration standard for non-ICP parameters?		X	
If yes for any of the above, was the sample diluted to obtain the result on Form !?			X

Corrected Sample Analysis Data Sheets

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		THOROTOM TO	minuloto pain .	J., 22 2	1
Lab Name: AQUA	ATEC		Contract: 9	1082	K40248F
Lab Code: AQUA	AI_ Ca	se No.: BI	O SAS No.	•	SDG No.: 40009_
Matrix (soil/w	water): FISH	_		Lab Samp	le ID: 216198
Level (low/med	l): LOW_			Date Rec	eived: 10/12/93
<pre>\$ Solids:</pre>	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5				NR
	7440-36-0	Antimony_		-	NR
	7440-38-2 7440-39-3	Arsenic			NR NR
		Beryllium		-	NR NR
	7440-43-9	Cadmium		-	NR
	7440-70-2			-	NR
	7440-47-3	Chromium		-	NR
	7440-48-4	Cobalt		-	NR
	7440-50-8	Copper		-	NR
	7439-89-6	Iron		-	NR
	7439-92-1	Lead			NR
	7439-95-4	Magnesium			NR
	7439-96-5	Manganese			NR
		Mercury	0.05	_ ZN	CV
	7440-02-0	Nickel		_	NR
•	7440-09-7	Potassium		l_l	NR
	7782-49-2	Selenium_	· · · · · · · · · · · · · · · · · · ·	_	NR
	7440-22-4	Silver		-	NR
	7440-23-5	Sodium			NR
	7440-28-0 7440-62-2	Thallium_ Vanadium			NR NR
	7440-62-2	Zinc		-	NR
	7440-00-0	Cyanide		-	NR
		cyanitae		-	. [
	·			l l	. 1 1
Color Before:		Clarit	ty Before:	<i>6</i> 6	Texture:
Color After:		Clarit	ty After:		Artifacts:
Comments:					

1 INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
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	Ca		Contract: 9:			·
soil/water)			U SAS NO.	: _		SDG No.: 40009
	FISH	-		Lal	Sampl	e ID: 216200
.ow/med):	LOW_			Dat	te Rece	eived: 10/12/93
::	100.	0				
Concenti	ation	Units (ug	/L or mg/kg dry	y we	eight):	MG/KG
CAS 1	lo.	Analyte	Concentration	С	Q	M
7420-	00-E	Aliminim		_ -		NR
		Antimony		- -		NR
•				- -		NR
		Barium				NR
				_ _		NR
				_ -		NR
F -				_ -		NR
i i				- -		NR NR
				- -		NR NR
				- -		NR NR
				<u> - -</u>		NR
				- -		NR
				- -		NR
7439-	97-6		0.03	- :	<u>7 N</u>	cv
	02-0	Nickel				NR
						NR
				_ -		NR
1				_ -		NR
				_ -		NR
				1_1-	[NR
and the second s				- -		NR
7440-	00-0			[-[-	[NR
		Cyanide		- -		NR
fore:		Clarit	ty Before:	e		Texture:
ter:		Clarit	ty After:			Artifacts:
:			·			
	CAS N 7429- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7439- 7439- 7439- 7439- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440- 7440-	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-99-6 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-23-5 7440-28-0 7440-66-6	CAS No. 7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-98-6 7439-95-4 7439-95-4 7439-96-5 7440-02-0 7440-02-0 7440-02-0 7440-23-5 7440-23-5 7440-28-0 7440-66-6 fore: Chromium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide fore: Clarif	CAS No. Analyte Concentration 7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 8eryllium Cadmium Cadmium Calcium Chromium 7440-48-4 Cobalt 7440-50-8 7439-89-6 7439-92-1 Ray Ray Ray Ray Ray Ray Ray Ray Ray Ray	CAS No. Analyte Concentration C 7429-90-5 7440-36-0 Antimony Arsenic Barium Cadmium Ca	7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-43-9 7440-47-3 7440-47-3 7440-48-4 7440-50-8 7439-92-1 7439-95-4 Magnesium 7439-95-4 Manganese Mercury Mickel 7440-02-0 7440-09-7 7782-49-2 Selenium 7440-23-5 7440-23-5 7440-28-0 7440-66-6 Clarity Before: **Clarity After:

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Mame: AQU	ATEC		Contract: 91	1082	!	K40252F
			O SAS No.:	:		SDG No.: 40009
trix (soil/	- water): FISH	<u>. </u>		Lak	Sampl	e ID: 216202
vel (low/med	d): LOW_	_		Dat	e Rece	ived: 10/13/93
Solids:	100.	0				
C	oncentration	Units (ug	/L or mg/kg dry	y we	eight):	MG/KG
	CAS No.	Analyte	Concentration	c	Q	M
	7429-90-5	***************************************		_ -		NR
	7429-90-5			l—i-		NR NR
		Antimony_ Arsenic		- -		NR NR
	7440-38-2 7440-39-3	Barium		- -		NR NR
	7440-33-3	Beryllium		<u> - -</u>		NR NR
	7440-43-9	Cadmium		- -		NR NR
	7440-70-2	Calcium		- -		NR NR
	L	Chromium		 - -		NR
		Cobalt		- -		NR
	7440-50-8			- -		NR
	7439-89-6	Copper		- -		NR NR
	7439-92-1	Lead		- -		NR
_	7439-95-4	Magnesium		- -		NR
	7439-96-5	Manganese		- -		NR
	7439-97-6	Mercury	0.11	- -		CV
	7440-02-0	Nickel -		- -		NR
	7440-02-0	Potassium		- -		NR
	7782-49-2	Selenium	[- -		NR
	7440-22-4	Silver		- -		NR
		Sodium		- -		NR
	7440-28-0	Thallium	[———— ·	-		NR
	7440-28-0	Vanadium		- -		NR
	7440-66-6	Zinc		- -		NR
	7440 00 0	Cyanide		- -		NR
lor Before:		Clari	ty Before:	•		Texture:
lor After:		Clari	ty After:			Artifacts:
mments:	_					
					·	
			· · · · · · · · · · · · · · · · · · ·			

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Name: A	QUATEC		Contract: 91	108	2	K40253F
			O SAS No.:			SDG No.: 40009
trix (soi	l/water): FIS	н_		La	b Sampl	e ID: 216204
vel (low/	med): LOW			Da	te Rece	eived: 10/13/93
Solids:	100	.0		,		
	Concentratio	n Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		_		NR
	7440-36-0			-		NR NR
	7440-38-2			-		NR
	7440-39-3			-		NR
	7440-41-7			-		NR
	7440-43-9			-		NR
	7440-70-2			-		NR
	7440-47-3			-		NR
	7440-48-4			-		NR
	7440-50-8			-		NR
	7439-89-6	· · ·				NR
	7439-92-1			-		NR
	7439-95-4			-		NR
	7439-96-5			-		NR
	7439-97-6		0.10	 	~ \	CV
	7440-02-0			-	Z_N	NR
	7440-02-0			-		NR
	1			1-1		NR
	7782-49-2	1		-		NR NR
	7440-22-4			_		
	7440-23-5 7440-28-0			1–1		NR
	7440-28-0			II		NR
	7440-62-2			-		NR NR
	/440-00-0			—		NR NR
		Cyanide		-		I NK
lor Before	e:	Clari	ty Before:	ø.	······································	Texture:
lor After:		Clari	ty After:			Artifacts:
mments:			<u> </u>		•	

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO	
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کت Name: AQUA	ATEC		Contract: 91	1082	ı ,	K40254F
			D_ SAS No.:			SDG No.: 40009
atrix (soil/v						e ID: 216206
•		_				
evel (low/med	l): LOW_	-		Dat	e Rece	ived: 10/13/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y we	ight):	MG/KG
		· ·				- 1
	CAS No.	Analyte	Concentration	c	Q	М
•	7429-90-5	Aluminum		- -	·	NR
	7440-36-0	Antimony		- -		NR
	7440-38-2	Arsenic		- -		NR
	7440-39-3	Barium		- -		NR
	7440-41-7	Beryllium		- -		NR
	7440-43-9	Cadmium		{- -		NR
	7440-70-2	Calcium		- -		NR
	7440-47-3	Chromium		-		NR
	7440-48-4	Cobalt		- -		NR
	7440-50-8	Copper		- -		NR
	7439-89-6	Iron		- -		NR
	7439-92-1	Lead		- -		NR
<u>_</u>	7439-95-4	Magnesium		- -		NR
	7439-96-5	Manganese		- -		NR
	7439-97-6	Mercury	0.13	- -		CV
	7440-02-0	Nickel -		- -		NR
	7440-09-7	Potassium		- -		NR
•	7782-49-2	Selenium		- -		NR
	7440-22-4	Silver		- -		NR
	7440-23-5	Sodium		(-		NR
	7440-28-0	Thallium		- <i>-</i>		NR
	7440-62-2	Vanadium-		- -		NR
	7440-66-6	Zinc		- -		NR
		Cyanide_		= =		NR
•	l			<u> </u>	l	
olor Before:		Clari	ty Before:	<i>(</i> i)		Texture:
olor After:		Clari	ty After:			Artifacts:
omments:						
			_ <u></u>			

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

L. Mame: AOUA	ATEC		Contract: 9:	1082	K40255F
					SDG No.: 40009
Matrix (soil/w	_				le ID: 216208
, ,	·	_		_	
Level (low/med	l): LOW_			Date Rece	eived: 10/13/93
% Solids:	100.	0			
Co	oncentration	Units (ug	/L or mg/kg dry	y weight):	: MG/KG
	CAS No.	Analyte	Concentration	c Q	м
	7429-90-5				NR
	7440-36-0	Antimony_			NR
	7440-38-2	Arsenic_			NR
	7440-39-3 7440-41-7	Barium Beryllium	· · · · · · · · · · · · · · · · · · ·		NR NR
	7440-43-9	Cadmium			NR NR
	7440-70-2			-	NR
	7440-47-3			_	NR
	7440-48-4			_	NR
	7440-50-8				NR
	7439-89-6	Iron			NR
	7439-92-1		·		NR
	7439-95-4 7439-96-5	Manganese		-	NR NR
	7439-97-6	Mercury_	0.28	_ ZN	CV
	7440-02-0	Nickel -		- 	NR
	7440-09-7	Potassium			NR
·	7782-49-2	Selenium_			NR
	7440-22-4				NR
	7440-23-5	Sodium		_	NR
	7440-28-0	Thallium_ Vanadium			NR
	7440-62-2 7440-66-6	Zinc		-	NR NR
	7440-00-0	Cyanide			NR
		0,440		-	***
	·	· ———— ·	· · · · · · · · · · · · · · · · · · ·	· - · ·	·
Color Before:		Clarit	y Before:	<u></u>	Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					
					~
					
					

FORM I - IN

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

dame: AQU	ATEC		Contract: 9:	1082		K40256F
Lab Code: AQU	AI Ca	se No.: BI	O SAS No.:	<u> </u>	- •	SDG No.: 40009
Matrix (soil/	_		_			ID: 216210
Level (low/med	WAI . P	_		Date	Recei	ved: 10/13/93
	_			Date	Neces	10/15/95
<pre>\$ Solids:</pre>	100.	0				
Ce	oncentration	Units (ug	/L or mg/kg dry	y weig	ght):	MG/KG
	CAS No.	Analyte	Concentration	c (2 M	
	7429-90-5	Aluminum		-	—— ₁₀	ĪR
	7440-36-0	Antimony_		-		IR .
	7440-38-2	Arsenic -	· · · · · · · · · · · · · · · · · · ·	-		IR
	7440-39-3	Barium —		-		rr
	7440-41-7	Beryllium				TR
	7440-43-9	Cadmium_				IR
	7440-70-2	Calcium_				IR .
	7440-47-3	Chromium_				TR
	7440-48-4	Cobalt		_ <u>_</u>		IR
	7440-50-8	Copper				TR
	7439-89-6	Iron		-		TR
	7439-92-1	Lead		-		TR
$\overline{}$	7439-95-4	Magnesium		-		TR
	7439-96-5 7439-97-6	Manganese Mercury	0.16	- 31		IR IV
	7440-02-0	Nickel -		- - -		IR I
	7440-02-0	Potassium		-		IR
-	7782-49-2	Selenium		- -		iR
	7440-22-4	Silver		- -		TR
	7440-23-5	Sodium		-		IR
	7440-28-0	Thallium		-		IR
	7440-62-2	Vanadium -		-	N	IR
	7440-66-6	Zinc				IR
		Cyanide		- -	_N	IR
Color Before:		Clarit	y Before:	_	 T	! Cexture:
Color After:		Clarit	y After:		P	Artifacts:
Comments:						
commencs:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

سے Name: AQI	JATEC	TEC Contract: 91082					
ab Code: AQU	AI_ Ca	se No.: BI	O SAS No.:	: _		SDG N	o.: 40009 __
atrix (soil/	water): FISH	<u> </u>		L	ab Samp	le ID:	216212
evel (low/me	ed): LOW_			Da	ate Rec	eived:	10/13/93
Solids:	100.	0					
C	Concentration	Units (ug	/L or mg/kg dry	Y	weight)	: MG/KG	
	CAS No.	Analyte	Concentration	С	Q	м	
	7429-90-5	A Trime i mira		-		NR	
	7440-36-0	Antimony		-		NR NR	
	7440-38-2	Arsenic _		 –		NR	
	7440-39-3	Barium		-		NR	
	7440-41-7	Beryllium		-		NR	
	7440-43-9	Cadmium		-		NR	
	7440-70-2	Calcium		_		NR	
	7440-47-3	Chromium				NR	
	7440-48-4	Cobalt		_		NR	
	7440-50-8	Copper		_		NR	
	7439-89-6	Iron		_		NR	
	7439-92-1	Lead		_		NR	
		Magnesium		-		NR	
	7439-96-5	Manganese		_	= 31	NR	
		Mercury_	0.28	 _	<u>Z</u> n	CV	
		Nickel		_		NR NR	
	7782-49-2	Potassium Selenium		-		NR NR	
	7440-22-4	Selenium_ Silver		_		NR	•
	7440-23-5	Sodium		-		NR	
		Thallium		-		NR	
	7440-62-2	Vanadium		-		NR	
	7440-66-6	Zinc		-		NR	
		Cyanide		-		NR	
				_			
olor Before:		Clarit	y Before:	a is	-	Textur	e:
olor After:		Clarit	y After:		_	Artifa	cts:
omments:							

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Ab Name: AQUATEC	F	K40276F			082	10	Contract: 9			me: AOUATI	ab Na
Cas No. Analyte Concentration C Q M	40009	DG No.: 4	SI								
Cas No.	14	ID: 21621	le J	 Sampl	lab S	L		<u> </u>	r): FISH	(soil/wat	atrix
CAS No.	3/93	ed: 10/13	eive	Rece	Date 1	D			LOW_	(low/med):	evel
CAS No.								0	100.	ds:	Soli
T429-90-5		G/KG	: MC	ght):	weig	У	/L or mg/kg dry	Units (ug	ntration	Conc	
7440-36-0 Antimony 7440-38-2 Arsenic NR NR 7440-39-3 Barium NR NR NR 7440-41-7 Beryllium NR NR NR 7440-47-3 Cadmium NR NR 7440-47-3 Chromium NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7439-97-6 Mercury 0.25 NR 7440-02-0 Nickel NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR NR NR 7440-66-6 Zinc NR NR NR NR 7440-66-6 Zinc NR NR NR NR NR NR NR N			M	Q	Q	c	Concentration	Analyte	S No.	l c	
7440-36-0 Antimony 7440-38-2 Arsenic NR NR NR 7440-41-7 Beryllium NR NR NR NR NR NR NR N		.			_	 _					
7440-38-2 Arsenic					-]	-					
T440-39-3					-	-					
7440-41-7 7440-43-9 7440-47-2 Calcium 7440-47-3 Chromium 7440-50-8 Copper 7439-89-6 Iron 7439-95-4 Magnesium 7439-96-5 Manganese 7439-97-6 Mercury 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7740-22-4 Silver 77440-23-5 Sodium 77440-28-0 Thallium 77440-66-6 Zinc					-	-				1 7	
7440-43-9 Cadmium					-	-					
7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-92-1 1cad 7439-95-4 Magnesium 7439-96-5 Manganese 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc NR NR NR NR NR NR NR NR NR NR NR NR NR					-	-				7	
7440-48-4 7440-50-8 7439-89-6 1ron 17439-95-4 Magnesium 7439-96-5 Manganese 7439-97-6 Mercury 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7440-22-4 Silver 7440-23-5 Sodium 7440-66-6 Thallium 7440-66-6 Zinc NR NR NR NR NR NR NR NR NR NR NR NR NR					-	-					
7440-50-8 7439-89-6 1ron 7439-92-1 Lead 7439-95-4 Magnesium 7439-96-5 Manganese 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7440-22-4 Silver 7440-23-5 Sodium 7440-66-6 Zinc NR NR NR NR NR NR NR NR NR NR NR NR NR											
7439-89-6 Iron Lead NR NR NR NR NR NR NR N										B	
7439-92-1 Lead NR NR NR NR NR NR NR N					_	_					
7439-95-4 Magnesium 7439-96-5 Manganese 7439-97-6 Mercury 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7440-22-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc 7440-66-6 Zinc					-	_					
7439-96-5 Manganese Mercury 0.25 NR CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR NR 7782-49-2 Selenium NR 7440-23-5 Sodium NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR					-	-	· · · · · · · · · · · · · · · · · · ·			1	
7439-97-6 Mercury 0.25 N CV NR 7440-02-0 Nickel NR NR NR NR NR NR NR NR NR NR NR NR NR					-	-				1	
7440-02-0 Nickel NR 7440-09-7 Potassium 7782-49-2 Selenium 7440-22-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc NR					-	-					
7440-09-7 7782-49-2 Selenium 7440-22-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc NR NR NR NR NR NR NR NR					-1-2-"	-	0.25				
7782-49-2 Selenium					-	-					
7440-22-4 Silver NR NR NR NR NR NR NR					-	-					
7440-23-5 Sodium					-	1-					
7440-28-0 Thallium NR NR NR NR NR NR					-	-					
7440-62-2 Vanadium					-	1-					
						1-		Vanadium -	10-62-2	7	
Cyanide									10-66-6	7	
		٤	NR		-1			Cyanide		}	
<u></u>		_1	I	1	_	۱_	1	li		اا	
olor Before: Clarity Before: Texture:		exture:	Te			& is	ty Before:	Clarit		Before: _	lor
olor After: Clarity After: Artifacts:		tifacts:	Art		_		ty After:	Clarit		After: _	lor
omments:										ts:	mmen

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Code: AQUAI	√Name: AQ	UATEC		Contract: 9	108	32	K40277F
Date Received: 10/13							SDG No.: 40009
Cas No.	rix (soil	/water): FI	SH_		La	ab Sampl	le ID: 216216
Cas No.	el (low/m	ed): LO	w		Da	ate Rece	eived: 10/13/93
CAS No.	olids:	10	0.0				
T429-90-5	•	Concentrati	on Units (ug	/L or mg/kg dry	y v	veight):	: MG/KG
T440-36-0		CAS No.	Analyte	Concentration	С	Q	м
T440-36-0		7429-90-	5 Aliminim		-		ND
7440-38-2		•			-		·
7440-39-3			2 Arsenic		-		
7440-41-7 7440-43-9 7440-47-3 Cadmium 7440-47-3 Chromium 7440-48-4 Cobalt 7440-50-8 Copper 7439-89-6 Tron 7439-92-1 Lead Magnesium 7439-95-4 Magnesium 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7782-49-2 Selenium 7782-49-2 Sodium 77440-23-5 Sodium 77440-23-5 Thallium 77440-66-6 Zinc Cyanide Clarity Before: MR MR MR MR MR MR MR MR MR M							
7440-43-9 7440-70-2 7440-47-3 Chromium 7440-48-4 Cobalt 7440-50-8 Copper 7439-89-6 Tron 7439-92-1 Tron Tron Tron Tron Tron Tron Tron Tron					-		
7440-70-2					-		
7440-47-3					[-		
7440-48-4 7440-50-8 7439-89-6 1ron 7439-92-1 Lead 7439-95-4 Magnesium MR 7439-96-5 Manganese Marcury Mercury Mickel MR 7440-02-0 Nickel MR 7440-02-1 Nickel MR NR		-			-		
7440-50-8 7439-89-6 1ron 7439-95-4 Magnesium 7439-96-5 Manganese 7440-02-0 7440-09-7 Potassium 7782-49-2 Selenium 7440-23-5 7440-28-0 Thallium 7440-66-6 Zinc Cyanide Copper Iron NR NR NR NR NR NR NR NR NR NR NR NR NR		1			-		
7439-89-6							
7439-92-1 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-22-4 7440-23-5 7440-28-0 7440-66-6 7440-66-6 Cyanide Clarity Before: NR NR NR NR NR NR NR					-		
7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-22-4 7440-23-5 7440-28-0 7440-66-6 Cyanide Rights and serious Manganese Mercury 0.10 TN TN TN TN TN TN TN TN TN T							
7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-22-4 7440-23-5 7440-66-6 7440-66-6 Cyanide 7440-66-5 7439-96-5 Manganese Mercury 0.10 NR NR NR NR NR NR NR NR NR NR NR NR NR	_						
7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-22-4 7440-23-5 7440-28-0 7440-62-2 7440-66-6 Cyanide Clarity Before:		7439-96-	5 Manganese		-		
7440-02-0 Nickel NR NR NR NR NR NR NR N		7439-97-	6 Mercury	0.10	-	N	
7782-49-2 Selenium NR NR NR NR NR NR NR N		7440-02-0	Nickel -		-		NR
7440-22-4 7440-23-5 7440-28-0 7440-62-2 7440-66-6 Zinc Cyanide Clarity Before: Texture:		7440-09-	7 Potassium		-		
7440-23-5 7440-28-0 7440-62-2 7440-66-6 Zinc Cyanide Clarity Before: Texture:		7782-49-3	2 Selenium		-		NR
7440-28-0 Thallium Vanadium Zinc NR NR NR Cyanide Cyanide Texture:		7440-22-4	4 Silver -		-		
7440-28-0 Thallium Vanadium 7440-62-2 Zinc NR NR NR Cyanide Clarity Before: Texture:		7440-23-	5 Sodium		-		NR
7440-66-6 Zinc NR NR NR Cyanide Clarity Before: * Texture:		7440-28-0	Thallium		-		
Cyanide NR NR Clarity Before: Texture:		7440-62-2	2 Vanadium		-		NR
lor Before: Clarity Before: Texture:		7440-66-6	5 Zinc	· C	-		NR
lor Before: Clarity Before: Texture:			Cyanide		-		NR
			_				ll
	or Before:	<u> </u>	Clarit	cy Before:	6 6	-	Texture:
or After: Clarity After: Artifacts:	or After:		Clarit	y After:		_	Artifacts:
nments:	ments:			·			

FORM I - IN

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

aw Name: AQUA	TEC		Contract: 9	108	32	K40278F
						SDG No.: 40009
trix (soil/w	vater): FISH			La	ab Sampl	e ID: 216218
vel (low/med	l): LOW_	_		Da	ate Rece	ived: 10/13/93
Solids:	100.	0		,		
Co	ncentration	Units (ug	/L or mg/kg dry	y v	weight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aliminim		-		NR
		Antimony		-		NR
		Arsenic		-		NR
	7440-39-3			-		NR
	7440-41-7			-		NR
		Cadmium		-		NR
	7440-70-2	Calcium		-		NR
	7440-47-3	Chromium		-		NR
	7440-48-4	Cobalt		-		NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron		1_		nr
	7439-92-1	Lead				NR
/	7439-95-4	Magnesium				NR
	7439-96-5	Manganese		_		NR
	7439-97-6		0.27	_	<u>7</u> N	CV
		Nickel		_		NR
	7440-09-7			_		NR
		Selenium_		_		NR
	7440-22-4	1		_		NR
		Sodium		 _		NR
		Thallium		 -	II	NR NR
	7440-62-2	Vanadium_		-		NR NR
	7440-66-6	Zinc		 _	ll	
		Cyanide		<u> -</u>		NR
lor Before:		Clari	ty Before:	6.		Texture:
lor After:		Clari	ty After:		-	Artifacts:
mments:						

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQUATEC			Contract: 9	K40279F	
ab Code: AQU	AI_ Ca	se No.: BI	O SAS No.	SDG No.: 40009	
trix (soil/	water): FISH	<u>-</u>		Lab Sam	ple ID: 216220
vel (low/me	d): LOW_	_		Date Re	eceived: 10/13/93
Solids:	100.	0			
С	oncentration	Units (ug	/L or mg/kg dry	y weight	:): MG/KG
	CAS No.	Analyte	Concentration	C Q	М
•	7429-90-5	Aluminum	ļ		$- _{\overline{NR}} $
	7440-36-0	Antimony_			$-\left \begin{array}{c} NR \\ NR \end{array} \right $
	7440-38-2	Arsenic		-	$-\left \frac{NR}{NR} \right $
	7440-38-2	Barium		-	$-\left \frac{NR}{NR} \right $
	7440-39-3	Beryllium		-	$-\left \begin{array}{c} NR \\ NR \end{array} \right $
	7440-43-9	Cadmium		-	$- _{NR}^{NR} $
	7440-70-2	Calcium		-	- NR
	7440-47-3	Chromium		-	$- _{NR}^{NR} $
	7440-48-4	Cobalt		-	$- _{NR}^{NR} $
	7440-50-8				$- \mathbf{NR} $
	7439-89-6	Copper		-	$- _{NR}^{NR} $
	7439-92-1	Lead		-	$- _{NR}^{NR} $
	7439-95-4	Magnesium		_	- NR
_	7439-96-5	Manganese			- NR
	7439-96-6	Mercury	0.19	- 	- CV
	7440-02-0	Nickel		_ <u></u> n	- NR
		Potassium		-	$-\left \frac{NR}{NR} \right $
	7782-49-2	Selenium		-	$- \frac{NR}{NR} $
	7440-22-4	Silver		-	- NR
	7440-23-5	Sodium		-	- NR
	7440-23-3	Thallium		-	- NR
	7440-28-0	Vanadium_		-	$- \mathbf{NR} $
	7440-62-2	Zinc		-	$-\left \frac{NR}{NR} \right $
	7440-00-0	Cyanide_			NR NR
lor Before:			l ty Before:		Marchana.
			ty After:		Artifacts:
lor After:		CIGIL	of wreer:		ALCITACES.
mments:					

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

≻√name: AQUA	TEC		Contract: 9:	108:	2	K40280F
o Code: AQUA	.I Ca	se No.: BI	O SAS No.:	:		SDG No.: 40009
•	_					
trix (soil/w	ater): FISH	_		La	b Sampı	e ID: 216222
vel (low/med): LOW_			Da	te Rece	eived: 10/13/93
Solids:	100.	0				
						D. G. 189.0
Co	ncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
	CAS No.	Analyte	Concentration	c	Q	M
				_ .		
	7429-90-5	Aluminum_		_ .		NR
		Antimony_		_ .		NR
		Arsenic_		_ .		NR
	7440-39-3	Barium		_ .		NR
	7440-41-7	Beryllium		_ .		NR
	7440-43-9			[_[.		NR
		Calcium_		_ .		NR
		Chromium				NR
	7440-48-4					NR
	7440-50-8	Copper		[NR
	7439-89-6	Iron		۱_۱.	-	NR
	7439-92-1	Lead		-		NR
_	7439-95-4	Magnesium		۱-۱.		NR
		Manganese		- -		NR
		Mercury	0.33	- -	7 N	CV
	7440-02-0	Nickel		- -		NR
		Potassium		- -		NR
•	7782-49-2	Selenium		- -		NR
		Silver		- -		NR
		Sodium		- -		NR
	7440-28-0			- -		NR
	7440-62-2	Vanadium_		- -	[NR
	7440-66-6	Zinc		- -		NR
	7440 00 0	Cyanide		- -		NR
		cyanide		- -		I I I
or Before:		Clarit	y Before:	ا ا دان		Texture:
or After:			y After:			Artifacts:
		~1~~ 1 ·				
ments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

au Name: AQU	ATEC		Contract: 9	108	2	K40281F
						SDG No.: 40009
trix (soil/	water): FISH	I_		La	b Sampl	e ID: 216224
vel (low/me	d): LOW_	_		Da	te Rece	ived: 10/13/93
Solids:	100.	0				
С	oncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		NR
	7440-36-0			-		NR
	7440-38-2	Arsenic		1-1		NR
	7440-39-3			1-1		NR
		Beryllium	' 	-		NR
	7440-43-9	Cadmium		-		NR
	7440-70-2	Calcium		1-1		NR
	7440-47-3	Chromium		-	1	NR
	7440-48-4			-		NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron		1-1		NR
		Lead		1-1		NR
$\overline{}$	•	Magnesium		-		NR
		Manganese		1-1		NR
	7439-97-6		0.31	1-1	<u>7n</u>	CV
		Nickel -		-	١	NR
		Potassium		-		NR
•		Selenium		1-1		NR
		Silver		1-1		NR
		Sodium		-		NR
	7440-28-0			-		NR
		Vanadium_				NR
	7440-66-6	Zinc		-		NR
		Cyanide		1-1		NR
or Before:		Clarit	y Before:	•	•	Texture:
or After:		Clarit	y After:	<u>-</u> .	-	Artifacts:
ments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO:

AD Name: AQU	ATEC		Contract: 91	1082	2	K40282F
	_					SDG No.: 40009
	_					_
Matrix (soil/	water): FISH	_		Lal	o Sampl	le ID: 216226
evel (low/med	d): LOW_	_		Dat	te Rece	eived: 10/13/93
Solids:	100.	0				
			/T /3 3			WC IVC
Co	oncentration	onits (ug	/L or mg/kg dry	/ WE	=1gnt):	mG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum				NR
	7440-36-0	Antimony_				NR
	7440-38-2	Arsenic		_ _		NR
	7440-39-3	Barium				NR
	7440-41-7	Beryllium				NR
		Cadmium		_ _		NR
		Calcium_		_ -		NR
		Chromium_		_ -	}	NR
		Cobalt		_ -		NR
		Copper		_ _		NR
		Iron		_ _		NR
		Lead		_ -		NR
		Magnesium		_]_		NR
		Manganese		_ _		NR
		Mercury_	0.13	<u>`</u>	<u>7</u> N	CV
	• -	Nickel		_ -		NR
•		Potassium		_ -		NR
		Selenium_]	NR
		Silver		_ -		NR
		Sodium		_ -		NR
		Thallium_		- -		NR
	7440-62-2	Vanadium_	·	_ -		NR
	7440-66-6	Zinc		- -		NR
		Cyanide		- -		NR
alam Rafawa.	·i			ا ـــا ــ مذ		
olor Before:			y Before:			Texture:
olor After:		Clarit	y After:			Artifacts:
omments:						
<u> </u>						
·						

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: A	Contract: 91082			K40287F		
ab Code: A	AQUAI_ Ca	se No.: BI	SAS No.:	: _		SDG No.: 40009
atrix (soi	l/water): FISH	<u>.</u>		Lā	ab Samp	le ID: 216228
evel (low/	med): LOW_			Da	ate Rec	eived: 10/14/93
Solids:	100.	0				
	Concentration	Units (ug	/L or mg/kg dry	, v	weight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		NR
•	7440-36-0	Antimony		-		NR
	7440-38-2	Arsenic		-		NR
	7440-39-3	Barium		_		NR
	7440-41-7	Beryllium				NR
	7440-43-9	Cadmium_				NR
	7440-70-2	Calcium_		_		NR
	7440-47-3	Chromium_		_		NR
		Cobalt		_		NR
	7440-50-8	Copper		-		NR NR
	7439-89-6 7439-92-1	Iron		-		NR
	7439-95-4	Magnesium		-		NR
	7439-96-5	Manganese		-		NR
	7439-97-6	Mercury	0.33	-	<u>N</u>	CV
	7440-02-0	Nickel'-		-	<u> </u>	NR
	7440-09-7	Potassium		-		NR
	7782-49-2	Selenium		-		NR
	7440-22-4	Silver -		-		NR
	7440-23-5	Sodium		_		NR
	7440-28-0	Thallium		-		NR
	7440-62-2	Vanadium_		-		NR
	7440-66-6	Zinc				NR
		Cyanide				NR
lor Befor	e:	Clarit	y Before:	ai.	-	Texture:
lor After	:	Clarit	y After:		_	Artifacts:
mments:						

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

> Name: AQUA	TEC		Contract: 91	1082	2	K40288F
ab Code: AQUA	I_ Ca	se No.: BI	SAS No.:	: _		SDG No.: 40009_
Matrix (soil/w	ater): FISH	_		Lal	b Sampl	e ID: 216230
Level (low/med): LOW_	-		Dat	te Rece	ived: 10/14/93
Solids:	100.	0 .				
Co	ncentration	Units (ug	/L or mg/kg dry	y we	eight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5			- -		NR
	7440-36-0	Antimony_				NR
	7440-38-2 7440-39-3	Arsenic		_ -		NR NR
	7440-39-3	Beryllium		- -		NR
	7440-43-9	Cadmium		- -		NR
	7440-70-2	Calcium		- -		NR
	7440-47-3	Chromium_				NR
	7440-48-4	Cobalt				NR
	7440-50-8	Copper				NR
	7439-89-6 7439-92-1	Iron Lead		- -		NR NR
	7439-95-4	Magnesium		- -		NR
	7439-96-5	Manganese		- -		NR
		Mercury	0.15		<u> </u>	CV
	•	Nickel				NR
•	7440-09-7	Potassium		_ -		NR
	7782-49-2	Selenium_		_ -		NR
	7440-22-4 7440-23-5	Silver Sodium		-		NR NR
	7440-28-0	Thallium		- -		NR
	7440-62-2	Vanadium		- -		NR
	7440-66-6	Zinc -		- -		NR
		Cyanide				NR
				l_l.		1
color Before:		Clarit	ty Before:	S à		Texture:
Color After:		Clari	ty After:			Artifacts:
Comments:						
						<u></u>
		<u>-</u>				

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AOUA	TEC		Contract: 91	1082		K40289F
						SDG No.: 40009
trix (soil/w	ater): FISH	<u></u>		Lab	Sampl	e ID: 216232
vel (low/med): LOW_	_		Dat	e Rece	eived: 10/14/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y we	ight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
				_ _		-
	7429-90-5	Aluminum_		_ _		NR
	7440-36-0	Antimony_		_ <u>_</u>		NR
		Arsenic		_ _		NR
		Barium		_ _		NR
		Beryllium		_ _		NR
		Cadmium_		_ _		NR
		Calcium_		_ _		NR
		Chromium_		l_l_		NR
	1	Cobalt		_ _		NR
		Copper				NR
		Iron		_ _		NR
J		Lead				NR
	7439-95-4	Magnesium				NR
		Manganese		- -		NR
	7439-97-6	Mercury	0.10	- -	N	cv
	7440-02-0	Nickel -		- -		NR
	7440-09-7	Potassium		- -		NR [
		Selenium		- -		NR
		Silver		- -		NR
		Sodium		- -		NR
		Thallium		1-1-	 [NR
	7440-62-2	Vanadium		- -		NR
	7440-66-6	Zinc		- -		NR
]	Cyanide	·	- -		NR
lor Before:		Clarit	ty Before:	6 5		Texture:
lor After:		Clarit	ty After:			Artifacts:
mments:		•				
		 				
						

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

b Name: A	QUATEC	Contract: 91082			K40290F	
b Code: A	AQUAI_ Ca	se No.: BI	O SAS No.:	: _		SDG No.: 40009
trix (soi	il/water): FISH	I _		La	b Samp	le ID: 216234
vel (low/	med): LOW_	_		Da	te Rec	eived: 10/14/93
Solids:	100.	0				
	Concentration	Units (ug	/L or mg/kg dry	y w	reight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
•	7429-90-5	Aliminim	<u> </u>	1-1		NR
	7440-36-0			-		NR NR
				-		NR NR
	7440-38-2 7440-39-3	Barium				NR NR
				-		NR NR
	7440-41-7		I 	-		
	7440-43-9			-		NR NR
	7440-70-2			_		NR
	7440-47-3			_		NR
	7440-48-4			_		NR
	7440-50-8	· · · —	l	1_1		NR
	7439-89-6	Iron		_		NR
	7439-92-1			1_1		NR
	7439-95-4			1_1		NR
	7439-96-5					NR
	7439-97-6		0.22	-	<u></u>	CV
	7440-02-0	Nickel		-		NR
	7440-09-7	Potassium		-		NR
	7782-49-2	Selenium		-		NR
	7440-22-4			-		NR
	7440-23-5			-		NR
	7440-28-0			-		NR
	7440-62-2	Vanadium -		-		NR
	7440-66-6	Zinc	-	-		NR
		Cyanide		-		NR
lor Befor	e:	Clari	ty Before:	& i	-	Texture:
lor After	:	Clari	ty After:		_	Artifacts:
mments:						

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Name: AQU	Contract: 91	1082		K40302F SDG No.: 40009		
			O SAS No.:			
	water): FISH					E ID: 216236
evel (low/med	d): Low_	_		Date	Recei	ived: 10/14/93
Solids:	100.	0				
C	oncentration	Units (ug	/L or mg/kg dry	y wei	ight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q I	1
	7429-90-5	Aluminum		_]_		NR I
		Antimony		-		IR
		Arsenic -		- -		TR
		Barium		-		VR .
		Beryllium		- -		VR
	7440-43-9	Cadmium		- -]]	NR
	7440-70-2	Calcium_				VR
		Chromium_				IR
		Cobalt				TR
		Copper				NR)
		Iron				TR
		Lead				₹R
_		Magnesium				√R
	7439-96-5	Manganese				VR
		Mercury_	0.11		N(<u>ev</u>
		Nickel		_ _		VR
•		Potassium		_ _		VR
		Selenium_				VR
	1	Silver		_ _		₹R
		Sodium	· 	_ _		VR
		Thallium_		- -		VR
	7440-62-2	Vanadium_		-		NR I
	7440-66-6	Zinc		- -		NR NR
		Cyanitae		_ _		
lor Before:		Clarit	y Before:	&	•	Texture:
lor After:		Clari	ty After:		j	Artifacts:
mments:						

FORM I - IN

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

			Fillet	% Lipids		
Sample ID	Description	Sex	Weight	Fillet	Body	
K40248	Small Mouth Bass	female	300g	1.46	3.84	
K40249	Small Mouth Bass	female	185g	1.06	3.70	
K40252	Small Mouth Bass	male	227g	1.42	5.40	
K40253	Small Mouth Bass	female	247g	1.44	3.60	
K40254	Small Mouth Bass	male	286g	3.08	5.60	
K40255	Small Mouth Bass	male	331g	0.84	4.50	
K40256	Small Mouth Bass	male	322g	0.81	5.10	
K40257	Small Mouth Bass	male	161g	0.51	1.70	
K40276	Small Mouth Bass	female	159g	0.50	2.20	
K40277	Small Mouth Bass	male	204g	0.69	3.40	
K40278	Small Mouth Bass	female	258g	1.34	4.70	
K40279	Small Mouth Bass	female	225g	0.51	1.50	
K40280	Small Mouth Bass	male	447g	1.92	4.10	
K40281	Small Mouth Bass	female	302g	1.42	5.30	
K40282	Small Mouth Bass	male	275g	1.05	3.80	
K40287	Small Mouth Bass	male	273g	0.26	2.93	
K40288	Small Mouth Bass	male	174g	0.56	3.28	
K40289	Small Mouth Bass	female	144g	0.50	2.91	
K40290	Smail Mouth Bass	female	220g	0.74	3.93	
K40302	Small Mouth Bass	male	180g	0.58	3.70	

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 40118

PCB, PESTICIDE AND MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, inc. Colchester, Vermont

Review performed by:

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40118 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and the corrected sample results. Analyses were performed on the following samples:

					Analy	rele :
Sample ID	Lat ID	Species	Description	Sample Location	Peet/PCB/ Hg	%Lipid
K40264W	201022	Sucker	whole body	Otsego City Dam	x	x
K40265W	201023	Sucker	whole body	Otsego City Dam	x	x
K40266W	201024	Sucker	whole body	Otsego City Dam	x	×
K40267W	201025	Sucker	whole body	Otsego City Dam	×	x
K40291W*	201382	Sucker	whole body	Otsego Dam	x	х
K40292W	201383	Sucker	whole body	Otsego Dam	×	×
K40293W	201384	Sucker	whole body	Otsego Dam	x	x
K40294W	201385	Sucker	whole body	Otsego Dam	×	×
K40295W	201386	Sucker	whole body	Otsego Dam	x	×
K40296W	201387	Sucker	whole body	Otsego Dam	x	×
K40297W	201388	Sucker	whole body	Otsego Dam	x	×
K40298W	201389	Sucker	whole body	Otsego Dam	x	×
K40299W	201390	Sucker	whole body	Otsego Dam	x	x
K40300W	201391	Sucker	whole body	Otsego Dam	x	x
K40301W	201392	Sucker	whole body	Otsego Dam	x	×

^{*} MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

'During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- -E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for nonlinearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in samples K40291W and K40292W. All data for these samples have been qualified as estimated. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All recoveries in the matrix spike blank were also within acceptable control limits.

8. System Performance and Overall Assessment *

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	x		
Are the samples numbers included in the narrative?	X	•	
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		x	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			·
Are surrogate recovery forms present?	_ X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Are the outliers correctly marked with an asterisk?	X		<u> </u>
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	x		
If yes, were the samples reanalyzed?		×	
Matrix Spikes			
Is there a matrix spike recovery form present?	Χ		
Were matrix spikes analyzed at the required frequency?	x		
How many spike recoveries were outside of QC limits?			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		<u>x</u>	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		x	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232			
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	X		
Are %D values for all compounds within limits (less than 15%)?	X		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X		

PCB Data Review Checklist - Page 3

	YES	NO	NA
Cleanup Efficiency Verification	· —		
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>x</u>		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			×
Compound Quantitation and Reported Detection Li	mits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality		-	
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates		<u> </u>	
Where field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding Time	Surrogates	- Column 1	Surrogates	- Column 2
	inie	TCX	DCB	TCX	DEB
K40264W	OK for all				
K40265W	samples				
K40266W					
K40267W					
K40291W		↓ (42)	↓ (54)	1 (44)	↓ (56)
K40291WMS					
K40291WMSD					
K40292W	·	↓ (45)	↓ (56)	↓ (47)	↓ (58)
K40293W					
K40294W					
K40295W					
K40296W					
K40297W					
K40298W					
K40299W					
K40300W					
K40301W					

Surrogate Standards TCX Tetrachioro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2618</u> Column: <u>RTX-35 / RTX-5</u>

Date:	5/19/94 1845	5/13	5/13	5/13	5/19	5/14	5/14
Time:	to 5/11/94 1334	1059	1132	1811	1845	0123	0156
	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont Cali	Cont. Cal.	Cent. Cal.
	*RSD	%D	X D	×Đ	% D	% D	% D
Aroclor 1016	4.6 / 4.6		7.5				
Arocior 1221	3.9 / 3.9						
Aroclor 1232	3.2 / 3.7						_
Aroclor 1242	2.7 / 2.8				0.0		
Aroclor 1248	3.2 / 2.7	0.0		0.5		3.0	
Aroclor 1254	2.8 / 2.8						1.0
Aroclor 1260	3.5 / 2.7	·					
Tetrachioro-m-xylene	4.9 / 3.6						
Decachlorobiphenyl	8.6 / 9.2						
Affected Samples:							
•							· ·
-							
i							
			•				
		· 		a.		····	
		, , , , , , , , , , , , , , , , , , ,					

PCB Calibration Summary - Page 2

Instrument: <u>HP2618</u> Column: <u>RTX-35 / RTX-5</u>

Date:		5/14	5/14				
Time:		0835	8090				
	initial Cal.	Cont. Cal.	Gord. Carl	Cont.	Cont. Cal.	Cont.	Cont. Cal
	₩RSD	SD SD	SED.	%D	%D	X 0	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Arocior 1248		4.0					
Aroclor 1254							
Arocior 1260			0.5				
Tetrachioro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							
ļ							
ļ							

CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO. K40264W Lab Name: Aquatec, Inc. Lab Code: AQUAI SDG:_ 91082 Case: BIO 40118 Contract: Phase Type: _ **BIOTA** Lab Sample ID: 201022 Phase Weight: 10.0 (g) **Date Received:** 10/13/93 1.0 Injection Volume: (uL) Date Extracted: 04/14/94 Dilution Factor: 2.0 Date Analyzed: 05/13/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.82	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.92	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40265W Lab Code: AQUAI Lab Name: Aquatec, Inc. 91082 Case: BIO SDG: 40118 Contract: Lab Sample ID: 201023 Phase Type: **BIOTA** 10/13/93 Phase Weight: 10.0 Date Received: **(g)** 1.0 04/14/94 Injection Volume: (uL) **Date Extracted:** 2.0 05/13/94 Dilution Factor: _ Date Analyzed:

Sulfur Clean-up:

Y

(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Arocior-1242	0.10	U
12672-29-6	Aroclor-1248	1.0	
11097-69-1	Aroclor-1254	0.81	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40266W Lab Name: Aquatec, Inc. Lab Code: **IAUDA** BIO SDG: 40118 Contract: 91082 Case: Lab Sample ID: Phase Type: **BIOTA** 201024 10.0 10/13/93 Date Received: Phase Weight: _ (g) Injection Volume: 1.0 (uL) Date Extracted: 04/14/94 Dilution Factor: _ 1.0 Date Analyzed: 05/13/94 Sulfur Clean-up: (Y/N) Ν

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	٥
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	Ū
53469-21-9	Aroclor-1242	0.30	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.39	
11096-82-5	Aroclor-1260	0.050	U

EPA SAMPLE NO. K40267W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 SDG: 40118 Contract: Case: BIO 201025 Phase Type: **BIOTA** Lab Sample ID: Phase Weight: 10.0 (g) Date Received: 10/13/93 Injection Volume: 1.0 (uL) Date Extracted: 04/14/94 2.0 Dilution Factor: Date Analyzed: 05/13/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.46	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.64	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40291W Lab Name: Aquatec, Inc. Lab Code: IAUDA 91082 BIO SDG: 40118 Contract: Case: 201382 Phase Type: **BIOTA** Lab Sample ID: Phase Weight: 10/14/93 10.0 (g) Date Received: Injection Volume: 1.0 Date Extracted: 04/14/94 (uL) 2.0 Dilution Factor: Date Analyzed: 05/13/94 Sulfur Clean-up: Ν (Y/N)

0.10 0.10	<u>U.T</u>
0.10	UJ
0.10	UJ
0.10	UJ
0.90	5
0.56	す
0.10	03
	0.10 0.90 0.56

EPA SAMPLE NO. K40292W Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40118 **BIOTA** Lab Sample ID: 201383 Phase Type: _ Phase Weight: 10.0 Date Received: 10/14/93 **(g)** Injection Volume: _ 1.0 (uL) Date Extracted: 04/14/94 Dilution Factor: 2.0 Date Analyzed: 05/13/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u>a</u>
12674-11-2	Aroclor-1016	0.10	U 7
11104-28-2	Aroclor-1221	0.10	N 2
11141-16-5	Aroclor-1232	0.10	UJ
53469-21-9	Aroclor-1242	0.10	บป
12672-29-6	Aroclor-1248	0.95	<u> </u>
11097-69-1	Aroclor-1254	0.56	
11096-82-5	Aroclor-1260	0.10	UJ

EPA SAMPLE NO. K40293W Lab Name: Aquatec, Inc. Lab Code: AQUAI SDG: ___ 40118 Contract: _ 91082 Case: BIO Phase Type: _ **BIOTA** Lab Sample ID: 201384 Phase Weight: __ 10.0 **Date Received:** 10/14/93 (g) Injection Volume: 1.0 Date Extracted: 04/14/94 (uL) Dilution Factor: 5.0 Date Analyzed: 05/13/94 Sulfur Clean-up: N (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	u
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Arocior-1232	0.25	U
53469-21-9	Arocior-1242	0.25	U
12672-29-6	Aroclor-1248	1.7	
11097-69-1	Aroclor-1254	0.87	
11096-82-5	Aroclor-1260	0.25	

EPA SAMPLE NO. K40294W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** SDG: 40118 Contract: 91082 Case: BIO Phase Type: __ **BIOTA** Lab Sample ID: 201385 Phase Weight: __ 10.0 Date Received: 10/14/93 **(g)** Injection Volume: __ 1.0 (uL) Date Extracted: 04/14/94 Dilution Factor: 2.0 Date Analyzed: 05/13/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	Ų
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	1.2	
12672-29-6	Aroclor-1248	0.10	Ų
11097-69-1 Aroclor-1254	1.3		
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40295W Lab Name: Aquatec, Inc. Lab Code: IAUDA Contract: 91082 Case: BIO SDG: 40118 Phase Type: **BIOTA** Lab Sample ID: 201386 Phase Weight: 10.0 (g) **Date Received:** 10/14/93 Injection Volume: Date Extracted: 1.0 (uL) 04/14/94 2.0 Dilution Factor: Date Analyzed: 05/13/94 (Y/N) Sulfur Clean-up: Ν

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	υ
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.3	
11097-69-1 Aroclor-1254	Aroclor-1254	0.75	
11096-82-5	Aroclor-1260	0.19	

EPA SAMPLE NO. K40296W Lab Code: Lab Name: Aquatec, Inc. **AQUAI** 91082 Case: BIO SDG: ___ 40118 Contract: Phase Type: **BIOTA** Lab Sample ID: 201387 Phase Weight: 10.0 (g) **Date Received:** 10/14/93 Injection Volume: 1.0 (uL) Date Extracted: 04/14/94 Dilution Factor: __ 2.0 Date Analyzed: 05/14/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.85	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.10	U
)	

EPA SAMPLE NO. K40297W Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 BIO 40118 Contract: Case: SDG: Phase Type: **BIOTA** Lab Sample ID: 201388 10.0 Phase Weight: Date Received: (g) 10/14/93 Injection Volume: 1.0 (uL) Date Extracted: 04/14/94 Dilution Factor: 2.0 Date Analyzed: 05/14/94 Sulfur Clean-up: Ν (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.10	_L
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	Ĺ
53469-21-9	Aroclor-1242	0.10	l
12672-29-6	Aroclor-1248	1.3	
11097-69-1	Aroclor-1254	0.83	
11096-82-5	11096-82-5 Aroclor-1260	0.10	Ĺ

EPA SAMPLE NO. K40298W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** Contract: 91082 Case: BIO SDG: 40118 Phase Type: **BIOTA** Lab Sample ID: 201389 Phase Weight: 10.0 **Date Received:** 10/14/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 04/14/94 2.0 Dilution Factor: _ Date Analyzed: 05/14/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.87	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Arocior-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40299W Lab Code: IAUDA Lab Name: Aquatec, Inc. 40118 BIO SDG: 91082 Case: Contract: **BIOTA** Lab Sample ID: 201390 Phase Type: Phase Weight: _ 10.0 **(g) Date Received:** 10/14/93 Injection Volume: _ (uL) 1.0 Date Extracted: 04/14/94 Dilution Factor: 2.0 Date Analyzed: 05/14/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	1.1	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40300W Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 BIO SDG: 40118 Contract: Case: Lab Sample ID: Phase Type: **BIOTA** 201391 Phase Weight: 10.0 Date Received: 10/14/93 **(g)** 1.0 Injection Volume: Date Extracted: 04/14/94 (uL) Dilution Factor: _ 2.0 05/14/94 Date Analyzed: Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.86	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	υ
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40301W Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIQ SDG: __ <u>40</u>118 Lab Sample ID: Phase Type: **BIOTA** 201392 Phase Weight: 10.0 (g) Date Received: 10/14/93 Injection Volume: 1.0 (uL) **Date Extracted:** 04/14/94 Dilution Factor: _ 2.0 Date Analyzed: 05/14/94 Sulfur Clean-up: Υ (Y/N)

CAS NO. COMPOUND	COMPOUND	CONCENTRATION	
		(mg/Kg)	<u> </u>
12674-11-2	Arocior-1016	0.87	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	υ
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.6	
11096-82-5	Aroclor-1260	0.10	U

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for both surrogates in sample K40291W. All data for this sample have been qualified as estimated. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40264W	gamma-Chlordane trans-Nonachlor 4,4'-DDE 4,4'-DDT	125.0% 351.5% 40.2% 311.8%
K40265W	Aldrin gamma-Chlordane 4,4'-DDE 4,4'-DDD 4,4'-DDT	37.4% 120.4% 44.0% 31.8% 508.0%
K40266W	Aldrin gamma-Chlordane 4,4'-DDE	34.4% 74.6% 36.4%
K40267W	gamma-Chlordane 4,4'-DDE	114.7% 58.9%
K40291W	Aldrin gamma-Chlordane 4,4'-DDE Dieldrin 4,4'-DDT	30.0% 174.4% 39.5% * 89.2% 383.3%
K40292W	gamma-Chlordane 4,4'-DDE Dieldrin 4,4'-DDT	155.4% 39.9% 60.6% 347.8%

K40293W	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDT	26.6% 157.3% 362.8% 29.7% 48.6% 308.5%
K40294W	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDT	29.2% 148.7% 325.0% 26.9% 56.4% 333.6%
K40295W	Aldrin Heptachlor Epoxide gamma-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDT	29.3% 62.4% 162.8% 376.6% 33.2% 88.1% 414.9%
K40296W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE Dieldrin 4,4'-DDT	33.3% 74.1% 169.6% 30.9% 89.9% 325.6%
K40297W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE Dieldrin 4,4'-DDT	25.7% 31.3% 166.0% 32.8% 57.4% 319.5%
K40298W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE Dieldrin 4,4'-DDT	33.7% 46.3% 145.3% 38.9% 404.4% 432.2%
K40299W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	33.0% 345.1% 144.1% 34.4% 409.3%

K40300W	Aldrin	42.5%
	Heptachlor Epoxide	29.3%
	gamma-Chlordane	139.9%
	trans-Nonachlor	369.4%
	4,4'-DDT	356.8%
K40301W	Aldrin	38.8%
	Heptachlor Epoxide	97.1%
	gamma-Chlordane	171.7%
	4,4'-DDE	30.2%
	4,4'-DDT	420.3%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries of Aldrin were above the acceptable control limit in the matrix spike and matrix spike duplicate samples. Recoveries of Dieldrin and 4,4'-DDT were also slightly above the control limit. The high recoveries can be attributed to positive interference from the sample matrix. Recoveries were within acceptable control limits for the matrix spike blank (MSB) sample. No qualifiers were added to the samples based on matrix spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	x		
Are the sample chain-of-custodies present?	x		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are the surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	<u> </u>		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	×		
If yes, were the samples reanalyzed?		X	
Were the method blanks reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
5 out of8			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
<u>0</u> out of <u>4</u>			
Blanks			
is the method blank summary form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	×		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
ls the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?		x	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts preblanks, and MS/MSD?	sent for	all samples,	
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	x	<u>-</u>	
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	X		
Is Form VII-2 present and complete for each mid-point standard analyzed?	×		
Are RPD values for all compounds < 25%?	×		
Analytical Sequence Check		- 	
is Form VIII present and complete for each column and each period of analyses?	x		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u>X</u>		
Cleanup Efficiency Verification			
Is Form IX-1 present for each lot of Florisil cartridges used?	<u> </u>		
Are all samples listed on the form?	<u> </u>		
If GPC cleanup was performed, is Form IX-2 present?			Х
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	X		
GPC calibration (80-110%)			X
Pesticide/PBB Identification	-		
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u> </u>		
Was GC/MS confirmation provided when required?			X
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?		X	
Were there any false negatives?		X	
Compound Quantitation and Reported Detection Limit	8		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		***************************************
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Where field duplicates submitted with the samples?		<u> </u>	

Pesticide/PBB Qualifier Summary Holding Time and Surrogates

Sample: ID:	Holding	Surrogates - Column 1		Surrogates - Column 2	
	Time	TCX	OCB	TCX	DCB
K4026	ok for all				
K402854W	samples				
K402864W			-		
K402674W					
K40291W					
K40291W		ļ (53)	↓ (52)	↓ (50)	J (51)
K40291WMS					
K40291WMSD					
K40292W			. "		-
K40293W					
K40294W					
K40295W					
K40296W					
K40297W					
K40298W					
K40299W					
K40300W					
K40301W					

Surrogates:

TCX Tetrachioro-m-xylene DCB Decachiorobiphenyl

Qualifiers:

D Surrogate diluted out

Recovery high Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: <u>HP2404</u> Column: <u>RTX-5</u>

Date:	5/17/94	5/23	5/23	5/24	5/24		
Time:	17;19	05:11	18:22	<i>D</i> 0:41	89;01		
	initial	Cont.	Cont. Cal.	Cont.	Cont. Cal.	Cont.	Cont.
v.	Cat. %RSD	%D	WD	Cal. %D	XD	Cal:	Cel. %D
2-Bromobiphenyl	ok	ok	ok	ок	ок		
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE		-					
Dieldrin							
4,4'-DDD							
cis-Nonachlor		·				<u> </u>	
4,4'-DDT							Ĺ
Hexabromobiphenyl (BP-6)		-					
Toxaphene						<u> </u>	
Tetrachloro-m-xylene							
Decachlorobiphenyl			<u> </u>			<u> </u>	
Affected Samples:		_					
ſ				1		1	

Pesticide/PBB Calibration Summary - Page 2

Instrument: <u>HP2404</u> Column: <u>RTX-35</u>

Date:	5/17/94	5/23	5/23	5/24	5/24		
Time:	17:19	05:11	16:22	00:41	09:01		
,	initial Cal.	Cont. Cal:	Gont. Cal.	Cont. Gal.	Cont. Cal.	Cont. Cal.	Cent Cal.
	%RSD	% D	%D	% D	%8	%D	% D
2-Bromobiphenyl	ok	ok	ok	ok	ok	ļ	
3-Bromobiphenyl							
4-Bromobiphenyl					·		
Hexachiorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chiordane							
trans-Nonachior							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT	<u>-</u>						
Hexabromobiphenyl (BP-6)							
Toxaphene							<u> </u>
Tetrachioro-m-xylene		7.			s i		
Decachlorobiphenyl							
Affected Samples:							<u> </u>
Γ							

Corrected Sample Analysis Data Sheets

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40264W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201022
Date Received: 10/13/93
Date Extracted: 04/14/94
Date Analyzed: 05/23/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.038		
1024-57-3	Heptachlor Epoxide	0.032		_
5103-74-2	gamma-Chlordene-	0.012		·K
5103-71-9	alpha-Chlordane	0.0050	U	•
39765 80 5	trans Nonachler	0.0068		R
72-55-9	4,4'-DDE	0.043	J	•
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.017		
5103-73-1	cis-Nonachlor	0.0050	Ü	_
50-29-3	4,4'-DDT	0.017		K
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	ı
72-54-8 5103-73-1 50-29-3 36355-01-8	Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	0.010 0.017 0.0050 0.017 0.020	U U	-F

Soxhlet

1.0

Dilution Factor:

Client ID No. Lab Name: Aquatec, Inc. K40265W Lab Code: AQUAI 91082 Contract: BIO SDG: Case: 40118 201023 Lab Sample ID: 10/13/93 Phase Type: **Biota Date Received:** Phase Weight: 10.0 **Date Extracted:** 04/14/94 **Extraction:** 05/23/94

Date Analyzed:

Sulfur Clean-up:

COMPOUND	CONCENTRATION (mg/Kg)	a	
2-Bromobiphenyl	0.010	U	
3-Bromobiphenyl	0.010	U	
4-Bromobiphenyl	0.010	U	
Hexachlorobenzene	0.0050	U	
gamma-BHC	0.0050	U	
Aldrin	0.034	J	
Heptachlor Epoxide	0.026		
gemme Chlordane	0.011		R
alpha-Chlordane	0.0058		•
trans-Nonachlor	0.0050	U	
4,4'-DDE	0.030	7	
Dieldrin	0.010	U	
4,4'-DDD	0.011,	J	
cis-Nonachlor	0.0050	U	
4,4' DDT	-0.011		R
Hexabromobiphenyl	0.020	U	'
Toxaphene	0.20	U	
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gamma-Chlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	Comp/Kg Comp/Kg	Comp/Kg) Comp/Kg)

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO SDG:

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

 Lab Sample ID:
 201024

 Date Received:
 10/13/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/23/94

 Sulfur Clean-up:
 N

Client ID No.

K40266W

40118

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	υ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.015	7
1024-57-3	Heptachlor Epoxide	0.012	
5103-74-2	gamma-Chlordane	0.0059	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.01Q	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40267W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201025

 Date Received:
 10/13/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/23/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.023	
1024-57-3	Heptachlor Epoxide	0.019	
5103 74 2	gemma Chiordane	0.0075	
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	υ
72-55-9	4,4'-DDE	0.020	d
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40291W

40118

N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

1.0

Dilution Factor:

 Lab Sample ID:
 201382

 Date Received:
 10/14/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/23/94

SDG:

Sulfur Clean-up:

CAS NO. COMPOUND CONCENTRATION Q (mg/Kg) 2052-07-5 2-Bromobiphenyl ロゴ 0.010 3-Bromobiphenyl 2113-57-7 0.010 UJ 92-66-0 ひゴ 4-Bromobiphenyl 0.010 Hexachlorobenzene 118-74-1 0.0050 ロブ gamma-BHC 58-89-9 0.0050 UJ 309-00-2 Aldrin 0.037 J 1024-57-3 Heptachlor Epoxide 0.032 R 5103-74-2 gamma-Chlordane 0.0090 5103-71-9 alpha-Chiordane 0.0050 UJ 39765-80-5 trans-Nonachior 0.0050 ひて 72-55-9 4,4'-DDE 0.030 Dieldrin 0.012 60-57-1 \overline{JN} 72-54-8 4,4'-DDD 0.010 UI 5103-73-1 cis-Nonachlor 0.0050 ログ R 50-29-3 4,4'-DDT 0.011 36355-01-8 Hexabromobiphenyl 0.020 UJ 8001-35-2 Toxaphene 0.20 UJ

 Lab Name:
 Aquatec, Inc.
 K40292W

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40118

 Lab Sample ID:
 201383

 Phase Type:
 Biota
 Date Received:
 10/14/93

Client ID No.

Dilution Factor:	1.0	Sulfur Clean-up:	N
Extraction:	Soxhlet	Date Analyzed:	05/23/94
Phase Weight:	10.0 g	Date Extracted:	04/14/94
Phase Type:	Biota	Date Received:	10/14/93
		Lau Sample ID.	201303

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	1
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	1
58-89-9	gamma-BHC	0.0050	U	1
309-00-2	Aldrin	0.047		1
1024-57-3	Heptachlor Epoxide	0.044		
5103 74 2	gamma-Chlordane	0.012		R
5103-71-9	alpha-Chiordane	0.0050	U	1
39765-80-5	trans-Nonachlor	0.0050	U	1
72-55-9	4,4'-DDE	0.045	7]
60-57-1	Dieldrin	0.013	NE	1
72-54-8	4,4'-DDD	0.018,		1
5103-73-1	cis-Nonachlor	0.0050	U	1
50 29 3	4,4' DDT	0.016		IR
36355-01-8	Hexabromobiphenyl	0.020	U	1``
8001-35-2	Toxaphene	0.20	U	1

 Lab Name:
 Aquatec, Inc.
 K40264W

 Lab Code:
 AQUAI
 SDG:
 40118

 Case:
 BIO
 SDG:
 40118

 Lab Sample ID:
 201022
 201022

 thase Type:
 Biota
 Date Received:
 10/13/93

Client ID No.

		Lab Sample ID.	201022
Phase Type:	Biota	Date Received:	10/13/93
Phase Weight:	10.0 g	Date Extracted:	04/14/94
Extraction:	Soxhlet	Date Analyzed:	05/23/94
Dilution Factor:	1.0	Sulfur Clean-up:	N
			

	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
	2052-07-5	2-Bromobiphenyl	0.010	U	
	2113-57-7	3-Bromobiphenyl	0.010	U	
Г	92-66-0	4-Bromobiphenyl	0.010	U	
	118-74-1	Hexachlorobenzene	0.0050	U	
	58-89-9	gamma-BHC	0.0050	U	
	309-00-2	Aldrin	0.038		
	1024-57-3	Heptachlor Epoxide	0.032		_
	5103-74-2	gamma-Chlordane	0.012		R
	5103-71-9	alpha-Chlordane	0.0050	υ	•
F	39765 80 5	trans-Nonachler	0.0068		R
Г	72-55-9	4,4'-DDE	0.043	J	•
Г	60-57-1	Dieldrin	0.010	U	
Г	72-54-8	4,4'-DDD	0.017,		
	5103-73-1	cis-Nonachlor	0.0050	U	_
	50-29-3	4,4'-DDT	0.017		K.
	36355-01-8	Hexabromobiphenyl	0.020	U	•
Г	8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40265W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201023

 Date Received:
 10/13/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/23/94

 Sulfur Clean-up:
 N

COMPOUND	CONCENTRATION (mg/Kg)	Q	
2-Bromobiphenyl	0.010	U	
3-Bromobiphenyl	0.010	U	
4-Bromobiphenyl	0.010	U	
Hexachlorobenzene	0.0050	U	
gamma-BHC	0.0050	U	
Aldrin	0.034	J	
Heptachlor Epoxide	0.026		
gamma Chlordane	0.011		R
alpha-Chlordane	0.0058		`
trans-Nonachlor	0.0050	U	
4,4'-DDE	0.030	7	
Dieldrin	0.010	U	
4,4'-DDD	0.011	J	
cis-Nonachlor	0.0050	U	
4,4' DDT	0.011		LR.
Hexabromobiphenyl	0.020	U	•
Toxaphene	0.20	U	
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gemma Chlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	2-Bromobiphenyl 0.010 3-Bromobiphenyl 0.010 4-Bromobiphenyl 0.010 Hexachlorobenzene 0.0050 gamma-BHC 0.0050 Aldrin 0.034 Heptachlor Epoxide 0.026 gamma-Ghlordane 0.011 alpha-Chlordane 0.0058 trans-Nonachlor 0.0050 4,4'-DDE 0.030 Dieldrin 0.010 4,4'-DDD 0.011 cis-Nonachlor 0.0050 4,4'-DDT 0.0050 4,4'-DDT 0.0050	Comp/Kg Comp/Kg

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40266W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201024

Date Received: 10/13/93

Date Extracted: 04/14/94

Date Analyzed: 05/23/94

Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.015	6
1024-57-3	Heptachlor Epoxide	0.012	
5103-74-2	gamma-Chlordane	0.0059	77
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.014	Ü
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010.	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40267W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201025

Date Received: 10/13/93

Date Extracted: 04/14/94

Date Analyzed: 05/23/94

Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.023		i
1024-57-3	Heptachlor Epoxide	0.019		i
- 5103 74 2 -	gamma Chlordane	0.0075		R
5103-71-9	alpha-Chlordane	0.0050	U	,
39765-80-5	trans-Nonachlor	0.0050	U	ĺ
72-55-9	4,4'-DDE	0.020	4	l
60-57-1	Dieldrin	0.010	υ	l
72-54-8	4,4'-DDD	0.010	U	•
5103-73-1	cis-Nonachlor	0.0050	U	
50-29-3	4,4'-DDT	0.010	U	
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40291W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201382

 Date Received:
 10/14/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/23/94

 Sulfur Clean-up:
 N

CAS	S NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
205	2-07-5	2-Bromobiphenyl	0.010	UJ	
2113	3-57-7	3-Bromobiphenyl	0.010	UJ	
92-	-66-0	4-Bromobiphenyl	0.010	υJ	
118	I-74-1	Hexachlorobenzene	0.0050	UJ	
58-	89-9	gamma-BHC	0.0050	UJ	
309	-00-2	Aldrin	0.037	7	ı
1024	4-57-3	Heptachlor Epoxide	0.032	4	
510	3-74-2	gamma-Chlordane	0.0090		R
5103	3-71-9	alpha-Chlordane	0.0050	UJ	
3976	5-80-5	trans-Nonachlor	0.0050	υJ	
72-	55-9	4,4'-DDE	0.030	7	
60-	57-1	Dieldrin	0.012	ZN	
72-	-54-8	4,4'-DDD	0.010	UT	
5103	3-73-1	cis-Nonachlor	0.0050	ひし	
50-	29-3	4,4'-DDT	0.011		R
3635	5-01-8	Hexabromobiphenyl	0.020	ر ط	
800	1-35-2	Toxaphene	0.20	UF	}

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

1.0

Client ID No. K40292W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor:

 Lab Sample ID:
 201383

 Date Received:
 10/14/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/23/94

 Sulfur Clean-up:
 N

			_
COMPOUND	CONCENTRATION (mg/Kg)	a	
2-Bromobiphenyl	0.010	υ	
3-Bromobiphenyi	0.010	U	1
4-Bromobiphenyl	0.010	U	į
Hexachlorobenzene	0.0050	U	
gamma-BHC	0.0050	U	1
Aldrin	0.047		1
Heptachlor Epoxide	0.044		1_
gamma Chlordane	0.012		R
alpha-Chlordane	0.0050	U	ľ
trans-Nonachlor	0.0050	U	1
4,4'-DDE	0.045	য	1
Dieldrin	0.013	JN	}
4,4'-DDD	0.019,]
cis-Nonachlor	0.0050	U]
4,4' DDT	0.016		7R
Hexabromobiphenyl	0.020	U	1''
Toxaphene	0.20	U	7
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gamma Ghlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	Comp/Kg Comp/Kg	Comp/Kg Comp/Kg

 Lab Name:
 Aquatec, Inc.
 K40293W

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40118

 Lab Sample ID:
 201384

 Thase Type:
 Riota
 Date Received:
 10/14/93

Client ID No.

Phase Type: **Biota Date Received:** 10/14/93 04/14/94 Phase Weight: 10.0 Date Extracted: Extraction: 05/23/94 Soxhlet Date Analyzed: Dilution Factor: 1.0 Sulfur Clean-up: N

				_
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	1
2113-57-7	3-Bromobiphenyl	0.010	Ü	7
92-66-0	4-Bromobiphenyl	0.010	Ü	7
118-74-1	Hexachiorobenzene	0.0050	U	7
58-89-9	gamma-BHC	0.0050	U	7
309-00-2	Aldrin	0.054	J	7
1024-57-3	Heptachlor Epoxide	0.046		7
5103 74 2	gamma Chlordane	0.015		$\exists R$
5103-71-9	alpha-Chlordane	0.0050	Ū	٦''
39765-80-5	trans Nonachior	0.0086		$\exists \mathcal{R}$
72-55-9	4,4'-DDE	0.064	7	٦``
60-57-1	Dieldrin	0.017		7
72-54-8	4,4'-DDD	0.027		7
5103-73-1	cis-Nonachlor	0.0050	U	7
50-29-3	4,4' DDT	0.024		$\exists R$
36355-01-8	Hexabromobiphenyl	0.020	U	٦٠
8001-35-2	Toxaphene	0.20	U	7
				_

 Lab Name:
 Aquatec, Inc.
 K40294W

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40118

 Lab Sample ID:
 201385

 thase Type:
 Biota
 Date Received:
 10/14/93

Client ID No.

		rap Sample in:	
Phase Type:	Biota	Date Received:	10/14/9
Phase Weight:	10.0 g	Date Extracted:	04/14/9
Extraction:	Soxhlet	Date Analyzed:	05/23/9
Dilution Factor:	1.0	Sulfur Clean-up:	N
			

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	İ
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.053	7	l
1024-57-3	Heptachlor Epoxide	0.044		
5103-74-2	gamma Chlordano	0.016		R
5103-71-9	alpha-Chlordane	0.0050	U	`
39765-80-5	trans-Nonachler	0.0096		R
72-55-9	4,4'-DDE	0.070	J	`
60-57-1	Dieldrin	0.017	77	ŀ
72-54-8	4,4'-DDD	0.030		
5103-73-1	cis-Nonachlor	0.0050	U	1
50-29-3	4,4'-DDT	0.023		1R
36355-01-8	Hexabromobiphenyl	0.020	U	1
8001-35-2	Toxaphene	0.20	U	1

 Lab Name:
 Aquatec, Inc.

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201386

Date Received: 10/14/93

Date Extracted: 04/14/94

Date Analyzed: 05/23/94

Sulfur Clean-up: N

Client ID No.

K40295W

40118

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	ł
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	υ	ĺ
58-89-9	gamma-BHC	0.0050	U	İ
309-00-2	Aldrin	0.050	7	
1024-57-3	Heptachlor Epoxide	0.045	JN	
5103 74 2	gamma Chlordane	0.014		R
5103-71-9	alpha-Chlordane	0.0050	U	
39765 80 5	trans Nonachior	0.0077		IR
72-55-9	4,4'-DDE	0.056	J	1,
60-57-1	Dieldrin	0.013	JN	1
72-54-8	4,4'-DDD	0.022		1
5103-73-1	cis-Nonachlor	0.0050	U	1
50 29 3	4,4' DDT	0.018		IR.
36355-01-8	Hexabromobiphenyl	0.020	U	1
8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

1.0

Phase Type:

Extraction:

Dilution Factor:

Phase Weight:

Client ID No. K40296W

40118

Biota 10.0 g Soxhlet

 Lab Sample ID:
 201387

 Date Received:
 10/14/93

 Date Extracted:
 04/14/94

 Date Applying the Control of the Control o

SDG:

Date Analyzed: _ Sulfur Clean-up:

05/23/94 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	1
92-66-0	4-Bromobiphenyi	0.010	U	1
118-74-1	Hexachlorobenzene	0.0050	U	1
58-89-9	gamma-BHC	0.0050	U	1
309-00-2	Aldrin	0.045	7	1
1024-57-3	Heptachlor Epoxide	0.042	JN	1
5103-74-2	gamma-Chlordane	0.013		k
5103-71-9	alpha-Chlordane	0.0050	U	T
39765-80-5	trans-Nonachior	0.0050	U	1
72-55-9	4,4'-DDE	0.056	J	1
60-57-1	Dieldrin	0.012	JN	1
72-54-8	4,4'-DDD	0.021		1
5103-73-1	cis-Nonachlor	0.0050	U	1
50 29 3	4,4' DDT	0.018		4
36355-01-8	Hexabromobiphenyl	0.020	U	1
8001-35-2	Toxaphene	0.20	U	7

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

K40297W

Client ID No.

SDG: 40118

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201388

 Date Received:
 10/14/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/24/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	. 0.0050	U	ŀ
309-00-2	Aldrin	0.053	J	
1024-57-3	Heptachlor Epoxide	0.048	C	
5103-74-2	gamma-Chlordane	0.014		IR
5103-71-9	alpha-Chiordane	0.0050	U	
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.059	7	
60-57-1	Dieldrin	0.015	JN	
72-54-8	4,4'-DDD	0.025		
5103-73-1	cis-Nonachlor	0.0050	U	1
50 29 3	4,4' DDT	0.020		IR
36355-01-8	Hexabromobiphenyl	0.020	U	1 `
8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.
Lab Code: AQUAI

Contract: 91082

Case: BIO SDG: 40118

Lab Sample ID: 201389

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201389

Date Received: 10/14/93

Date Extracted: 04/14/94

Date Analyzed: 05/24/94

Sulfur Clean-up: N

Client ID No.

				_
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	1
2113-57-7	3-Bromobiphenyl	0.010	U	1
92-66-0	4-Bromobiphenyl	0.010	U	1
118-74-1	Hexachlorobenzene	0.0050	U	1
58-89-9	gamma-BHC	0.0050	U	1
309-00-2	Aldrin	0.053	J]
1024-57-3	Heptachlor Epoxide	0.048	3	1
5103-74-2	gemma Chlordene	0.016		1R
5103-71-9	alpha-Chlordane	0.0050	U] `
39765-80-5	trans-Nonachlor	0.0050	U]
72-55-9	4,4'-DDE	0.055	フ]
60 57 1	- Dieldrin	0.014] R
72-54-8	4,4'-DDD	0.021		7 ``
5103-73-1	cis-Nonachlor	0.0050	U	1 _
50-29-3	4,4' DDT	0.018		7R
36355-01-8	Hexabromobiphenyl	0.020	Ü] `
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40299W

40118

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 201390
Date Received: 10/14/93
Date Extracted: 04/14/94
Date Analyzed: 05/24/94
Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	υ	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.055	J	
1024-57-3	Heptachler Epoxide	0.057		R
5103-74-2	gamma Chlordano	0.017		R
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachior	0.0050	U	
72-55-9	4,4'-DDE	0.066	7	
60-57-1	Dieldrin	0.010	U	l
72-54-8	4,4'-DDD	0.020		1
5103-73-1	cis-Nonachlor	0.0050	U	1
50 20 3	4,4' DDT	0.023		R
36355-01-8	Hexabromobiphenyl	0.020	U	1 ``
8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.
K40300W

40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201391

 Date Received:
 10/14/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/24/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
				
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachiorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.045	5	
1024-57-3	Heptachlor Epoxide	0.044	4	
5103-74-2	gamma Chlordane	0.015		R
5103-71-9	alpha-Chlordane	0.0050	U	•
39765-80-5	trans Nonschlor	0.0085		R
72-55-9	4,4'-DDE	0.069		' `
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.026		
5103-73-1	cis-Nonachlor	0.0050	U	
50 29 3	4,4' DDT	0.021		.R
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.
K40301W

SDG: 40118

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201392
Date Received: 10/14/93
Date Extracted: 04/14/94
Date Analyzed: 05/24/94
Sulfur Clean-up: N

	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
	2052-07-5	2-Bromobiphenyl	0.010	U	
	2113-57-7	3-Bromobiphenyl	0.010	U	!
	92-66-0	4-Bromobiphenyl	0.010	U	
	118-74-1	Hexachlorobenzene	0.0050	U	
Γ	58-89-9	gamma-BHC	0.0050	U	
	309-00-2	Aldrin	0.058	J	
F	1024 57 3	Heptachlor Epoxide	0.058		R
F	5103-74-2	gamma-Chlordane	0.018		R
	5103-71-9	alpha-Chlordane	0.0093		•
Γ	39765-80-5	trans-Nonachlor	0.0050	U	
Γ	72-55-9	4,4'-DDE	0.080	4	
Γ	60-57-1	Dieldrin	0.010	υ	
	72-54-8	4,4'-DDD	0.024		
Γ	5103-73-1	cis-Nonachlor	0.0050	U	1
	50 29 3	4,4'-DDT	0.027		R
	36355-01-8	Hexabromobiphenyl	0.020	U	
	8001-35-2	Toxaphene	0.20	Ü]

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The difference between laboratory duplicates was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA_
Data Completeness and Deliverables		,	
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	<u></u>		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X .	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	<u> </u>		
SDG No.?	<u> </u>		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	×		
Cyanides			X
Is the data legible?	X		
Is the data properly labeled?	<u> </u>		
Holding Times			
Were mercury analyses performed within 28 days?	X		·

	YES	NO	NA_
Were cyanide distillations performed within 14 days?			X
Were other metal analysis performed within 6 months?			X
Form I (Final Data)			
Are all forms complete?	<u> </u>		
Are correct units indicated on Form I's?	X		
Are all "less than IDL" values properly coded with "U"?	X		
Are the correct concentration qualifiers used with final data?	X		
Was a brief physical description of samples given on Form I's?		X	
Calibration			
Is a record of at least 2 point calibration present for ICP analysis?			X
is a record of 5 point calibration present for Hg analysis?	X		
Is a record of 4 point calibration present for:			
Flame AA?			X
Furnace AA?			X
Cyanides?			X
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?			X
Is correlation coefficient less than .995 for:			
Mercury Analysis?	X		
Cyanide Analysis?			X
Atomic Absorption Analysis?			X
Form II A (Initial and Continuing Calibration Verifica	tion)		
Present and complete for every metal and cyanide?	X		
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?			X
Hg (80-120 %R)?	X		
Cyanides (85-115 %R)?			Х

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	×		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			×
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		-
Are all calibration blanks (when IDL <crdl) (crdls)?<="" contract="" detection="" equal="" less="" limits="" or="" required="" td="" than="" the="" to=""><td>X</td><td></td><td></td></crdl)>	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			×
Form III (Preparation Blank)			<u> </u>
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	·

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			× .
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			X
Is concentration of prep. blank below the negative CRDL?		X	
Form IV (ICP Interference Check Sample)			,
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits (±20%)?			X
If no, is concentration of AI, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
Form V A (Spiked Sample Recovery - Pre-Digestion/I	Pre-Distil	lation)	
Present and complete for:			
each SDG?	X		
each matrix type?	X	<u></u>	
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?	X		
If no, is sample concentration greater than or equal to four times spike concentration?			X
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?			X
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?		X	
between 126-200%?		X	
greater than 200%?		X	
Form VI (Lab Duplicates)			
Present and complete for:			
each SDG?	X		

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			×
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		X	
Form VII (Laboratory Control Sample)		-	<u> </u>
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		\ <u></u>
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
Form IX (ICP Serial Dilution)			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			×
Was field blank(s) used for Serial Dilution Analysis?			×
Are results outside control limit flagged with an "E"" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			×
Are any % difference values:			
> 10%?		_	. X
≥100%?			×
Furnace Atomic Absorption (AA) QC Analysis			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA?			X
			

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?			X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?			X
Is analytical spike recovery outside the control limits (85-115%) for any sample?			X
Form VIII (Method of Standard Addition Results)			
Present?		X	
If no, is any Form I result coded with "S" or a "+"?		X	
Is coefficient of correlation for MSA less than 0.990 for any sample?			X
Was MSA required for any sample but not performed?		X	
Is coefficient of correlation for MSA less than 0.995?			X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?			X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?			X
Field Blank			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?			X
If no, was field blank value already rejected due to other QC criteria?			X
Form X, XI, XII (Verification of Instrumental Paramet	ers)	, 	-
Is verification report present for:			
Instrument Detection Limits (quarterly)?	X		
ICP Interelement Correlation Factors (annually)?			X
ICP Linear Ranges (quarterly)?			X
Form X (Instrument Detection Limits)			
Are IDLs present for:			
all the analytes?	X		
all the instruments used?	<u> </u>		

	YES	NO	NA
Is IDL greater than CRDL for any analyte?		X	
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.			×
Was any sample result higher linear range of ICP.			X
Was any sample result higher than the highest calibration standard for non-ICP parameters?		X	
If yes for any of the above, was the sample diluted to obtain the result on Form I?			X

Corrected Sample Analysis Data Sheets

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

	INORGANIC ANALYSES DATA	SHEET	
ಹಿಂದ Name: AQUATEC	Contract: 9	1082	K40264W
Lab Code: AQUAI_ C	ase No.: BIO SAS No.	:	SDG No.: 40118_
Matrix (soil/water): FIS	н_	Lab Sample	e ID: 201022
Level (low/med): LOW		Date Rece	ived: 10/13/93
<pre>\$ solids:</pre> <pre>100</pre>	.0		
Concentratio	n Units (ug/L or mg/kg dr	y weight):	MG/KG
CAS No.	Analyte Concentration		м
7429-90-5	Aluminum	- ;	NR
7440-36-0	Antimony		NR
7440-38-2			NR
7440-39-3 7440-41-7			NR NR
7440-41-7	Cadmium		NR NR
7440-70-2			NR
7440-47-3			NR
7440-48-4			NR
7440-50-8			NR
7439-89-6			NR
7439-92-1	·	J _ I I	NR
7439-95-4	· · · · · · · · · · · · · · · · · · ·		NR
7439-96-5 7439-97-6			NR CV
7440-02-0			NR
7440-09-7			NR
7782-49-2			NR
7440-22-4	Silver		NR
7440-23-5			NR
7440-28-0			NR
7440-62-2 7440-66-6			NR
/440-66-6	ZincCyanide		NR NR
	cyaniue	-	
Color Before:	Clarity Before:	#	' Texture:
Color After:	Clarity After:	····	Artifacts:
Comments:			

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		INORGANIC .	ANALYSES DATA S	SHEET	
Lao Name: AQUA	TEC		Contract: 91	1082	K40265W
Lab Code: AQUA	I_ Ca	se No.: BI	O SAS NO.		SDG No.: 40118_
Matrix (soil/w	ater): FISH			Lab Samp	le ID: 201023
Level (low/med	_	_		Date Rec	eived: 10/13/93
% Solids:	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5			-	NR
	7440-36-0	Antimony_			NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium			NR
	7440-41-7				NR
	7440-43-9				NR
	7440-70-2			_	NR
	7440-47-3	Chromium_			NR
	7440-48-4	Cobalt			NR
	7440-50-8	Copper		_	NR
	7439-89-6	Iron		-	NR
	7439-92-1	Lead		-	NR
	7439-95-4	Magnesium			NR
	7439-96-5	Manganese		-	NR
	7439-97-6	Mercury_	0.02		CV
	7440-02-0	Nickel			NR
	7440-09-7	Potassium		-	NR
,	7782-49-2	Selenium_			NR
	7440-22-4	Silver			NR
	7440-23-5 7440-28-0	SodiumThallium		[-[NR NR
	7440-28-0			-	NR
	7440-66-6	Zinc		-	NR
	7440 00-0			-	NR
		Cyanide		-	
Color Before:		Clarit	ty Before:	<u> </u>	Texture:
Color After:		Clarit	ty After:		Artifacts:
Comments:					

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Matrix (soil/water): FISH_ Lab Sample ID: 20 Level (low/med): LOW_ Date Received: 10 Solids: 100.0	. – –––
Lab Code: AQUAI_ Case No.: BIO_ SAS No.: SDG No. Matrix (soil/water): FISH_ Lab Sample ID: 20 Level (low/med): LOW_ Date Received: 10 Level Solids: 100.0	266W
Level (low/med): LOW Date Received: 10% Solids: 100.0	: 40118_
Solids: 100.0	1024
)/13/93
Concentration Units (ug/L or mg/kg dry weight): MG/KG	
CAS No. Analyte Concentration C Q M	
T429-90-5	
Color Before: Clarity Before: Texture:	
Color After: Clarity After: Artifact	ts:
Comments:	

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

∴ Name: AQUA	TEC		Contract: 91	108	2	K40267W
b Code: AQUA	.I Ca	se No.: BI	O SAS No.:	:		SDG No.: 40118
trix (soil/w	_					ole ID: 201025
vel (low/med	l): LOW_			Da	te Rec	eived: 10/13/93
Solids:	100.	0				
			/L or mg/kg dry	, w	eight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
	7429-90-5	Aluminum		-		$\left \frac{1}{NR} \right $
		Antimony -		-1		NR
		Arsenic				NR
		Barium_				NR
		Beryllium		_		NR
	7440-43-9 7440-70-2	Cadmium_ Calcium		_		NR NR
	7440-70-2	Chromium		-		NR NR
	7440-48-4	Cobalt		-		NR
	7440-50-8	Copper_		-		NR
	7439-89-6	Iron		-1		NR
	7439-92-1	Lead		-		NR
	1	Magnesium	-	-		NR
_		Manganese		-1		NR
	7439-97-6	Mercury	0.02	-1		cv
	7440-02-0	Nickel		-		NR
	7440-09-7	Potassium				NR
•		Selenium_				NR
		Silver				NR
		Sodium		_		NR
		Thallium_		_		NR
	7440-62-2	Vanadium_		_		NR
	7440-66-6	Zinc		-1		NR
		Cyanide		-1		NR
	l			- I		.ll
lor Before:		Clarit	ty Before:	<u>. </u>	•	Texture:
lor After:		Clarit	ty After:		-	Artifacts:
mments:						

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Na کمت	me: AQUA	TEC		Contract: 91	L082_		K40291W
							SDG No.: 40118
		ater): FISH					e ID: 201382
Level	(low/med): LOW	-		Date	e Rece	ived: 10/14/93
	•	_	-				, , , , ,
Soli	.as:	100.	D				
	Co	ncentration	Units (ug	/L or mg/kg dry	we:	ight):	MG/KG
		CAS No.	Analyte	Concentration	С	Q	M
		7429-90-5	Aluminum		_ _		$\frac{1}{NR}$
•		7440-36-0	Antimony		- -		NR
		7440-38-2	Arsenic -		-		NR
		7440-39-3	Barium —		- -		NR
		7440-41-7	Beryllium		-1-		NR
		7440-43-9			- -		NR
		7440-70-2	Calcium		_ _		NR
		7440-47-3			_ _		NR
		7440-48-4	Cobalt				NR
		7440-50-8	Copper				NR
		7439-89-6	Iron				NR
			Lead				NR
_	•		Magnesium		_ _		NR
	•		Manganese		_]		NR
		7439-97-6	Mercury_	0.03	_ _		CV
			Nickel				NR
			Potassium				NR
			Selenium_		_ _		NR
			Silver		_ _		NR
			Sodium		_ _		NR
			Thallium_		_ -		NR
			Vanadium_ Zinc				NR NR
		7440-66-6	Cvanide		- -		NR NR
		ļ 	cyanitde		- -	[NK
olor	Before:		Clarit	ty Before:	 i	·	Texture:
olor	After:	 		ty After:			Artifacts:
ommen							
		······································	·				

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Name: AOU	ATEC		Contract: 91	108	2	K40292W
						SDG No.: 40118
atrix (soil/	_					le ID: 201383
evel (low/med	i): LOW_	_		Da	te Rec	eived: 10/14/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y w	eight):	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		NR
	7440-36-0	Antimony		- -		NR
	7440-38-2	Arsenic -		-		NR
	7440-39-3	Barium		-		NR
	7440-41-7	Beryllium		-		NR
	7440-43-9	Cadmium		-		NR
	7440-70-2	Calcium		-		NR
	_	Chromium		-	······	NR
		Cobalt -		-		NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron		-		NR
	7439-92-1	Lead		-		NR
_		Magnesium		-		NR
		Manganese		-		NR
		Mercury	0.03	-		CV
		Nickel -		-		NR
		Potassium		-		NR
		Selenium	· · · · · · · · · · · · · · · · · · ·	-		NR
		Silver		-		NR
		Sodium		-		NR
		Thallium		-		NR
	7440-62-2	Vanadium_				NR
	7440-66-6	Zinc				NR
		Cyanide				NR
olor Before:		Clarit	y Before:			Texture:
olor After:		Clarit	y After:			Artifacts:
mments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

→ Name: AQUA	TEC		Contract: 91	108	32	K40293W
						SDG No.: 40118
trix (soil/w				_		e ID: 201384
vel (low/med): LOW			Da	ate Rece	ived: 10/14/93
•	_	_				20020 20/21/00
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y v	veight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum	·	-		NR NR
		Antimony		-		NR
	7440-38-2	Arsenic -		_		NR
	7440-39-3	Barium		_		NR
		Beryllium				nr
	7440-43-9					NR
		Calcium_				NR
	7440-47-3	Chromium_		_		NR
	7440-48-4			_		NR
	7440-50-8	Copper		 _		NR
	7439-89-6	Iron		-		NR
		Lead		-		NR
	7439-95-4			[-]		NR NR
	7439-96-5 7439-97-6		0.03	-		CV
	7440-02-0	Mercury Nickel		-		NR
	7440-02-0			-		NR
	7782-49-2			-		NR
	7440-22-4			-		NR
		Sodium	·	-		NR
		Thallium		-		NR
	7440-62-2	Vanadium		-		NR
	7440-66-6	Zinc		-		NR
		Cyanide		-		NR
				_		
lor Before:		Clarit	cy Before:	6 5	-	Texture:
lor After:		Clarit	ty After:		-	Artifacts:
mments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

			INONOMITE A				
Lab Na	ame: AQUA	TEC		Contract: 9:	108	32	K40294W
							SDG No.: 40118
Matri:	x (soil/w	ater): FISH	-		La	ab Samp	le ID: 201385
Level	(low/med): LOW_		•	Da	ate Rec	eived: 10/14/93
% Sol:	ids:	100.	0				
	Co	ncentration	Units (ug	/L or mg/kg dry	y v	veight)	: MG/KG
		CAS No.	Analyte	Concentration	С	Q	м
		7429-90-5	Aluminum		_		NR
		7440-36-0	Antimony		-		NR
		7440-38-2	Arsenic -		-		NR
		7440-39-3	Barium				NR
		7440-41-7	Beryllium		_		NR
		7440-43-9	Cadmium_		_		NR
		7440-70-2 7440-47-3	Calcium Chromium		-		NR NR
			Cobalt		-		NR NR
		7440-50-8	Copper		-		NR
		7439-89-6	Iron		-		NR
		7439-92-1	Lead		-		NR
$\overline{}$			Magnesium		-		NR
			Manganese				NR
			Mercury	0.03			CV
			Nickel		_		NR
	•		Potassium		_		NR
		7782-49-2	Selenium_				NR
			Silver		-		NR NR
			Thallium		-		NR NR
		7440-62-2	Vanadium		-		NR
		7440-66-6	Zinc		-		NR
			Cyanide_		-		NR
Color	Before:		Clarit	y Before:	 	·	Texture:
Color	After:		Clarit	y After:		-	Artifacts:
Commer	nts:						

INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
	74020EW	

ib Name: AQU	ATEC		Contract: 91	108	2	K40295W
						SDG No.: 40118
trix (soil/	water): FISH	_		La	b Samp	ole ID: 201386
vel (low/me	d): LOW_	_		Da	te Rec	ceived: 10/14/93
Solids:	100.	0				
C	oncentration	Units (ug	/L or mg/kg dry	7 W	eight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		
		Antimony	[-		- NR
	7440-38-2	Arsenic		-		NR
	7440-39-3	Barium -		-1		NR
	7440-41-7	Beryllium		-		NR
	7440-43-9	Cadmium				NR
	7440-70-2	Calcium				NR
		Chromium				NR
		Cobalt				NR
		Copper				NR
		Iron				NR
		Lead		_		NR
		Magnesium	<u></u>]	_		NR
		Manganese		_		NR
	7439-97-6	Mercury	0.03	-		CV
		Nickel				NR
•		Potassium		-		NR
		Selenium_		-1		NR NR
		Silver		-1		- NR
		SodiumThallium		-1		- NR
		Vanadium_		[-]		- NR
	7440-66-6	Zinc		-		- NR
	7440 00 0	Cyanide_		- -		NR
lor Before:			y Before:			Texture:
lor After:	·—·	Clarit	y After:		_	Artifacts:
mments:						
<u> </u>						

INORGANIC ANALYSES DATA SHEET

EPA	SAMPL	E NO.
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	e: AQUATE	C		Contract: 91	108	2	K40296W
							SDG No.: 4011
	-	er): FISH			_		e ID: 201387
		LOW	_				ived: 10/14/93
VC1 (low/mea/.		_		Du		21001 20/24/55
Solid	s:	100.	0				
	Conc	entration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
		AS No.	Analyte	Concentration		Q	M
	1	AS NO.	Midiyce	Concentracton		Q	n
	7	429-90-5	Aluminum		-		NR
	7	440-36-0	Antimony_		-		NR
	7	440-38-2	Arsenic				NR
			Barium		<u> </u>		NR
			Beryllium				NR
			Cadmium_				NR
	•		Calcium_		[_]		NR
			Chromium_		 _		NR
			Cobalt		l _ l .		NR
			Copper		_		NR
			Iron		1_1		NR
		439-92-1	Lead		_		NR
_			Magnesium		_		NR
			Manganese		_		NR
		439-97-6	Mercury Nickel	0.03	_ .		CV NR
					- -		NR NR
			Potassium Selenium		-		NR
			Silver		-		NR
			Sodium		-		NR
			Thallium		-		NR
	1		Vanadium Vanadium		-		NR
		440-66-6	Zinc		-		NR
	'	440 00 0	Cyanide		1-1		NR
	_						
lor Be	efore: _		Clarit	y Before:	a.		Texture:
lor A	fter: _		Clarit	ty After:			Artifacts:
mments							
			•				

INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
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سی Name: AQUA	TEC		Contract: 91	1082		K40297W
ab Code: AQUA	I_ Ca	se No.: BI	O SAS No.:	:		SDG No.: 40118
atrix (soil/w	ater): FISH	_		Lab	Sample	e ID: 201388
evel (low/med): LOW_	-		Date	e Rece	ived: 10/14/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y we	ight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q 1	M
	7429-90-5	Aluminum	 ;	- -	₁	NR
	7440-36-0	Antimony_		- -		NR
	7440-38-2	Arsenic -		[-[-		NR
	7440-39-3	Barium		_ _		NR
	7440-41-7	Beryllium				NR
	7440-43-9	Cadmium		l_l_		NR
	7440-70-2	Calcium_		_ _		MR
	7440-47-3	Chromium_		 - -		NR
	7440-48-4 7440-50-8	Cobalt	[[-[-		NR NR
		Copper		- -		NR NR
	7439-92-1	Lead		 - -		NR
		Magnesium		- -		NR
—·		Manganese		- -		NR
		Mercury	0.04	- -		CV
	7440-02-0	Nickel		[- [-		NR
		Potassium		- -		NR
	7782-49-2	Selenium	[- -		NR
		Silver		[_[_		NR
		Sodium				NR
		Thallium_				NR
		Vanadium_				NR
	7440-66-6	Zinc		_ _		NR
		Cyanide		- -		NR
lor Before:	·	Clarit	ty Before:	! _	I	' Texture:
						
lor After:		Clari	ty After:			Artifacts:
mments:						
			•			

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40298W

אם Name: AQUA	TEC		Contract: 9:	1082	.
Lab Code: AQUA	.I_ Ca	se No.: BI	SAS No.	•	SDG No.: 40118_
Matrix (soil/w	ater): FISH	_ .		Lab Samp	le ID: 201389
Level (low/med): LOW_	_		Date Rec	eived: 10/14/93
% Solids:	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	M
	7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-47-3 7440-48-4 7440-50-8 7439-92-1 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-02-0 7440-23-5 7440-23-5 7440-28-0 7440-66-6	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide			NR NR NR NR NR NR NR NR NR NR NR NR NR N
Color Before:		Clarit	ty Before:	<u> </u>	Texture:
Color After:		Clarit	ty After:		Artifacts:
Comments:					
		F	NT - T MAC		TLM02

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

TEC		Contract: 91	108	2	K40299W
	se No.: BI				SDG No.: 40118
_					e ID: 201390
): LOW	· -		Da	te Rece	ived: 10/14/93
100.	0 -				
ncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
CAS No.	Analyte	Concentration	С	Q	m
			- -		NR
					NR
			_ .		NR
			 _].		NR
			-		NR NR
			- -		NR
			- :		NR
			- -		NR
7440-50-8	Copper		- :		nr
					NR
					NR
					NR
			_ .		NR
		0.02	_ .		CV
			- -		NR NR
			- -		NR
			- -		NR
			-		NR
			-		NR
					NR
7440-66-6			<u> </u>		NR
	Cyanide		-1		NR
l	Clarit	y Before:	l l. ♣	I	Texture:
				•	Artifacts:
		-		•	
	Tater): FISH DOW	Case No.: BIO ater): FISH 100.0 ncentration Units (ug) CAS No. Analyte 7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-70-2 7440-70-2 7440-50-8 7439-89-6 7439-92-1 7439-95-4 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-02-0 7440-02-0 7440-02-0 7440-02-0 7440-02-0 7440-02-0 7440-22-4 7440-23-5 7440-22-4 7440-23-5 7440-28-0 7440-66-6 Clarif	Tater): FISH_ 100.0 1	Case No.: BIO SAS No.: Sater SAS No.: Sater SAS No.:	Case No.: BIO

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

b Name: AQU	ATEC		Contract: 9	1082	K40300W
b Code: AQU	AI_ Ca	se No.: BIG	SAS No.	:	SDG No.: 40118
trix (soil/	water): FISH	, _		Lab Samp	le'ID: 201391
vel (low/med	d): LOW_	-10-		Date Rec	eived: 10/14/93
Solids:	100.	0			
Co	oncentration	Units (ug	/L or mg/kg dr	y weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-	NR
	7440-36-0	Antimony		-	NR
	7440-38-2	Arsenic -		1-1	NR
	7440-39-3	Barium	-	- -	NR
		Beryllium		-	NR
	7440-43-9	Cadmium			NR
	7440-70-2	Calcium			NR
	7440-47-3	Chromium			NR
	7440-48-4	Cobalt			NR
	7440-50-8	Copper			NR
	7439-89-6	Iron			NR
	7439-92-1	Lead			NR
	7439-95-4	Magnesium		1_1	NR
	7439-96-5	Manganese		-	NR
	7439-97-6	Mercury_	0.02	-	CV
	7440-02-0	Nickel	. 	-	NR
•		Potassium			NR
		Selenium_		-	NR NR
	7440-22-4	Silver Sodium		[-[NR NR
	7440-23-5 7440-28-0	Thallium		-	NR
	7440-28-0	Vanadium		-	NR
	7440-66-6	Zinc Zinc		-	NR
	/ 4 4 0 00 - 0	Cyanide		-	- NR
or Before:	.	Clarit	y Before:	6 5	Texture:
or After:		Clarit	y After:		Artifacts:

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

ab Name: AQU	ATEC	_	Contract: 91	108	32	K40301W
					_	SDG No.: 40118
trix (soil/	water): FISH	-		La	ab Samp	le ID: 201392
vel (low/med	i): LOW_	_	•	Da	ate Rec	eived: 10/14/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y v	weight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
•	7429-90-5	Aluminum		-		NR
	7440-36-0	Antimony	[[-		NR
•	7440-38-2	Arsenic		-		NR
	7440-39-3	Barium		-		NR
		Beryllium		-		NR
		Cadmium		-		NR
	7440-70-2	Calcium		_		NR
	7440-47-3	Chromium		_		NR
		Cobalt				NR
	7440-50-8	Copper				NR
	7439-89-6	Iron				NR
		Lead				NR
		Magnesium		_		NR
	7439-96-5	Manganese		_		NR
	7439-97-6	Mercury_	0.02	_		CV
		Nickel		_		NR
•	■ · · · · · · · · · · · · · · · · · · ·	Potassium		_		NR
		Selenium_		-		NR
		Silver		_		NR NR
		Thallium		-		NR NR
	7440-28-0	Vanadium_		-		NR
	7440-62-2	Zinc		-		NR
	7440-00-0	Cyanide		-		NR
				<u> -</u>		·
lor Before:			ty Before:			Texture:
lor After:		Clarit	ty After:		_	Artifacts:
LOI ALCEI.			 -			

FORM I - IN

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	%Lipid
K40264W	Otsego City Dam - Golden Redhorse Sucker	female	2.52
K40265W	Otsego City Dam - Golden Redhorse Sucker	female	2.36
K40266W	Otsego City Dam - Golden Redhorse Sucker	male	1.01
K40267W	Otsego City Dam - Golden Redhorse Sucker	male	1.96
K40291W	Otsego City Dam - Golden Redhorse Sucker	male	3.39
K40292W	Otsego City Dam - Golden Redhorse Sucker	female	2.22
K40293W	Otsego City Dam - Golden Redhorse Sucker	male	3.80
K40294W	Otsego City Dam - Golden Redhorse Sucker	male	4.12
K40295W	Otsego City Dam - Golden Redhorse Sucker	female	2.66
K40296W	Otsego City Dam - Golden Redhorse Sucker	male	2.38
K40297W	Otsego City Dam - Golden Redhorse Sucker	male	3.21
K40298W	Otsego City Dam - Golden Redhorse Sucker	male	2.91
K40299W	Otsego City Dam - Golden Redhorse Sucker	male	3.15
K40300W	Otsego City Dam - Golden Redhorse Sucker	female	3.25
K40301W	Otsego City Dam - Golden Redhorse Sucker	male	2.61

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 40139

PCB, PESTICIDE AND MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc. Colchester, Vermont

Review performed by:

Blasland, Bouck & Lee, Inc. Syracuse, New York

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<u>Summary</u>

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40139 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

					Analysis	
Sample ID	Lab ID	Species	Description	Sample Location	Peet/PCB/ Hg	%Lipid
K40268F	215570	carp	fillet	Otsego Dam	x	×
K40268R	215571	carp	carcass	Otsego Dam		x
K40269F	215572	carp	fillet	Otsego Dam	x	x
K40269R	215573	carp	carcass	Otsego Dam		x
K40270F	215574	carp	fillet	Otsego Dam	x	x
K40270R	215575	carp	carcass	Otsego Dam		X
K40271F	215576	carp	fillet	Otsego Dam	×	x
K40271R	215577	carp	CAICASS	Otsego Dam		x
K40272F	215578	carp	fillet	Otsego Dam	х	x
K40272R	215579	carp	carcass	Otsego Dam		x
K40273F	215580	carp	fillet	Otsego Dam	x	x
K40273R	215581	carp	carcass	Otsego Dam		x
K40274F	215582	carp	fillet	Otsego Dam	х	x
K40274R	215583	carp	carcass	Otsego Dam		x
K40275F	215584	carp	fillet	Otsego Dam	x	x
K40275R	215585	carp	carcass	Otsego Dam		x
K40284F	215622	carp	fillet	Otsego Dam	x	×
K40284R	215623	carp	carcass	Otsego Dam		x
K40285F	215586	carp	fillet	Otsego Dam	x	x
K40285R	215587	carp	carcass	Otsego Dam		x
K40286F	215588	carp	fillet	Otsego Dam	x	×
K40286R	215589	carp	carcass	Otsego Dam		x
K40315F	215590	carp	fillet	Trowbridge	x	x
K40315R	215591	carp	carcass	Trowbridge		×
K40316F	215592	carp	fillet	Trowbridge	x	×
K40316R	215593	carp	carcass	Trowbridge		×
K40317F	215594	carp	fillet	Trowbridge	×	×
K40317R	215595	carp	carcass	Trowbridge		x

					Analy	rais
Sample ID	Lab ID	Species	Description	Sample Location	Pest/PCB/ Hg	%Elpid
K40322F	215604	carp	fillet	Trowbridge	x	×
K40322R	215605	carp	CAICASS	Trowbridge		×
K40325F*	215606	carp	fillet	Trowbridge	×	×
K40325R	215607	carp	CAICASS	Trowbridge		×

MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for nonlinearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time with the exception of sample K40284F. All data for this sample have been qualified as estimated.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40271F, K40273F, K40275F, K40285F, K40316F K40325FMS, and K40325FMSD. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA.
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X	***************************************	
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		<u>x</u>	
Holding Times			
Have any holding times been exceeded?	X		
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		<u> x</u>	
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
out of			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
	`		
Blanks			
is a Method Blank Summary Form present?	x		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

PCB Data Review Checklist - Page 2

	YES	NO	NA_
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		<u> x</u>	
Do, any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		x	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	<u> </u>		
Aroclor 1221	<u> </u>		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	<u> </u>		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	X		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	×X		
Are %D values for all compounds within limits (less than 15%)?	x		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X		

PCB Data Review Checklist - Page 3

	YES	NO	NA
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	<u>X</u>		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X	· .	
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			×
Compound Quantitation and Reported Detection Li	mits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates		•	
Where field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding	Surrogates -	Column 1	Surrogates	- Column 2
	Time	TCX	DCB	TCX	DCB
K40268F					
K40269F					
K40270F					
K40271F		↓ (57)		ļ (<u>57)</u>	
K40272F					
K40273F		↓ (51)		↓ (58)	
K40274F					
K40275F		J (59)			
K40284F	+2				
K40285F		↓ (59)		Į (59)	
K40286F					
K40315F					
K40316F		↓ (59)		↓ (59)	
K40317F					
K40322F					
K40325F					
K40325FMS		↓ (52)			
K40325FMSD		↓ (47)		↓ (53)	

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2618
Column: RTX-35 / RTX-5

Date:	4/30/94 0543	5/6	5/6	5/7	5/7	5/7	5/7
Time:	to 5/1/94 0106	1401	1435	0044	0119	0809	0843
V	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont: Cal.	Cont. Cal.	Cont. Cal.
	%RSD	% D	X B	%D	% D	% B	% D
Aroclor 1016	4.2 / 4.4						3.0
Aroclor 1221	5.1 / 6.9						
Aroclor 1232	4.2 / 3.1						
Aroclor 1242	3.1 / 3.4						
Aroclor 1248	3.4 / 3.0	0.5		3.0		3.0	·
Arocior 1254	3.1 / 3.6		0.5				
Aroclor 1260	3.8 / 3.4				6.0		L
Tetrachioro-m-xylene	5.2 / 6.4						
Decachlorobiphenyl	7.9 / 8.1						
Affected Samples:							I
					7		
							
				øs			

PCB Calibration Summary - Page 2

Instrument: <u>HP2618</u> Column: <u>RTX-35 / RTX-5</u>

Date:		5.77	5/7	5/10	5/10	5/10	5/10
Time:		1534	1608	0423	0457	1147	1221
	initial Cal.	Cont. Cal.	Cont. Cal.	Cent. Cel.	Cont. Cal.	Cont. Cal:	Cont. Cal.
•	%RSD	% 0	%D	%D	% D	%D	%D
Aroclor 1016					0.5		
Aroclor 1221							
Aroclor 1232							
Aroclar 1242			2.0				6.0
Aroclor 1248		2.0		5.0		6.5	
Aroclor 1254							
Aroclor 1260							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							
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PCB Calibration Summary - Page 3

Instrument: <u>HP2618</u> Column: <u>RTX-35 / RTX-5</u>

Date:	5/10/94 1845	5/16	5/16	5/16	5/18		
Time:	to 5/11/94 1334	1430	1503	2122	2155		
1	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	% D	%D	%D	% D	% D	%D
Arocior 1016	4.6 / 4.6				7.0		
Aroclor 1221	3.9 / 3.9						
Aroclor 1232	3.2 / 3.7						
Aroclor 1242	2.7 / 2.8						
Aroclor 1248	3.2 / 2.7	2.0		1.0			
Aroclor 1254	2.8 / 2.8						
Aroclor 1260	3.5 / 2.7		1.5				
Tetrachioro-m-xylene	4.9 / 3.6						
Decachlorobiphenyl	8.6 / 9.2						
Affected Samples:							
·							
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PCB Calibration Summary - Page 4

Instrument: <u>HP2087</u> Column: <u>RTX-35 / RTX-5</u>

Date:	5/18/94 1800	5/19	5/19	5/19	5/19		
Time:	to 5/19/94 1254	1607	1640	2820	2353		
•	Initial Cal.	Gont. Cal.	Gant. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal
	%RSD	%D	*0	% D	%0	% D	% D
Aroclor 1016	3.9 /. 4.3		11.0				
Arocior 1221	4.6 / 5.5						
Aroclor 1232	2.9 / 3.2						
Aroclor 1242	3.6 / 3.3				1.5		
Aroclor 1248	3.1 / 3.0	1.5		0.5			
Aroclor 1254	3.0 / 3.0						
Aroclor 1260	3.2 / 2.3						
Tetrachioro-m-xylene	5.0 / 7.7						
Decachlorobiphenyl	8.8 / 7.2						
Affected Samples:							
		 _					<u></u>
							-
· <u>[</u>							
		<u></u>					
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CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO. K40268F Lab Code: AQUAI Lab Name: Aquatec, Inc. Contract: 91082 BIO SDG: 40139 Case: Phase Type: **BIOTA** Lab Sample ID: 215570 Phase Weight: 10.0 Date Received: 10/13/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 04/07/94 Dilution Factor: 1.0 Date Analyzed: 05/06/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	ι
11104-28-2	Aroclor-1221	0.050	ī
11141-16-5	Aroclor-1232	0.050	Į
53469-21-9	Arocior-1242	0.050	t
12672-29-6	Aroclor-1248	0.56	
11097-69-1	Aroclor-1254	0.30	
11096-82-5	Aroclor-1260	0.13	

EPA SAMPLE NO.

K40269F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

 Phase Type:
 BIOTA
 Lab Sample ID:
 215572

 Phase Weight:
 10.0
 (g)
 Date Received:
 10/13/93

 Injection Volume:
 1.0
 (uL)
 Date Extracted:
 04/07/94

Dilution Factor: 5.0 Date Analyzed: 05/06/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.76	
11104-28-2	Aroclor-1221	0.25	ι
11141-16-5	Arocior-1232	0.25	Ĺ
53469-21-9	Aroclor-1242	0.25	J
12672-29-6	Arocior-1248	0.25	
11097-69-1	Aroclor-1254	1.8	
11096-82-5	Aroclor-1260	0.28	

EPA SAMPLE NO. K40270F Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40139 Phase Type: **BIOTA** Lab Sample ID: 215574 Phase Weight: 10/13/93 10.0 Date Received: (0) Injection Volume: 1.0 (uL) Date Extracted: 04/07/94 Dilution Factor: 1.0 Date Analyzed: 05/07/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.050	υ
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Arocior-1242	0.48	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.23	
11096-82-5	Aroclor-1260	0.050	U

EPA SAMPLE NO. K40271F Lab Name: Aquatec, Inc. Lab Code: AQUAI 40139 Contract: 91082 Case: BIO SDG: **BIOTA** Phase Type: Lab Sample ID: 215576 Phase Weight: 10.0 (0) Date Received: 10/13/93 Injection Volume: 1.0 (uL) Date Extracted: 04/07/94 Dilution Factor: 2.0 Date Analyzed: 05/07/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.10	ับ
11104-28-2	Aroclor-1221	0.10	υ
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.1	
11097-69-1	Aroclor-1254	0.83	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO.
K40272F

 Lab Name:
 Aquatec, Inc.
 Lab Code:
 AQUAI

 Contract:
 91082
 Case:
 BIO
 SDG:
 40139

Phase Type: **BIOTA** Lab Sample ID: 215578 Phase Weight: Date Received: 10.0 10/13/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 04/07/94 Dilution Factor: 1.0 Date Analyzed: 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.53	
11104-28-2	Aroclor-1221	0.050	υ
11141-16-5	Arocior-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.62	
11096-82-5	Aroclor-1260	0.050	U

EPA SAMPLE NO.

K40273F

Lab Name: Aquatec, Inc. Lab Code: AQUAI

91082

Case: BIO

SDG: 40139

Phase Type: BIOTA
Phase Weight: 10.0 (g)
Injection Volume: 1.0 (uL)
Dilution Factor: 5.0

Contract:

215580

Date Extracted:

10/13/93 04/07/94

Date Analyzed:

05/10/94 N

Sulfur Clean-up: _

___(Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.25	u
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	l
53469-21-9	Aroclor-1242	0.25	ī
12672-29-6	Aroclor-1248	2.0	l
11097-69-1	Aroclor-1254	0.37	
11096-82-5	Aroclor-1260	0.19	J

EPA SAMPLE NO. K40274F Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 BIO SDG: 40139 Case: **BIOTA** Lab Sample ID: Phase Type: _ 215582 Phase Weight: 10.0 Date Received: 10/13/93 **(g)** Injection Volume: __ 1.0 Date Extracted: 04/07/94 (uL) Dilution Factor: 5.0 Date Analyzed: 05/07/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Arocior-1232	0.25	U
53469-21-9	Arocior-1242	2.2	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.7	
11096-82-5	Aroclor-1260	0.25	U

EPA SAMPLE NO.

 Phase Weight:
 10.0
 (g)
 Date Received:
 10/13/93

 Injection Volume:
 1.0
 (uL)
 Date Extracted:
 04/07/94

 Dilution Factor:
 5.0
 Date Analyzed:
 05/07/94

Sulfur Clean-up: N (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	(
11104-28-2	Aroclor-1221	0.25	
11141-16-5	Aroclor-1232	0.25	ι
53469-21-9	Aroclor-1242	1.2	
12672-29-6	Arocior-1248	0.25	Į
11097-69-1	Aroclor-1254	1.4	
11096-82-5	Aroclor-1260	0.25	Į

EPA SAMPLE NO. K40284F Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40139 Phase Type: **BIOTA** Lab Sample ID: 215622 (g) Phase Weight: 10.0 Date Received: 10/13/94 Injection Volume: 1.0 (uL) Date Extracted: 04/07/94 Dilution Factor: 5.0 05/19/94 Date Analyzed: Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
12674-11-2	Aroclor-1016	0.25	UJ
11104-28-2	Aroclor-1221	0.25	UJ
11141-16-5	Aroclor-1232	0.25	UJ
53469-21-9	Aroclor-1242	0.25	υJ
12672-29-6	Arocior-1248	3.0	J
11097-69-1	Aroclor-1254	2.4	7
11096-82-5	Aroclor-1260	0.25	υJ
11030-02-3	A100101-1200	0.23	<u> </u>

EPA SAMPLE NO. K40285F Lab Code: AQUAI Lab Name: Aquatec, Inc. SDG: _ 40139 Contract: 91082 Case: BIO Phase Type: **BIOTA** Lab Sample ID: 215586 Phase Weight: 10.0 Date Received: 10/14/93 (g) 1.0 Injection Volume: (uL) Date Extracted: 04/07/94 Dilution Factor: 5.0 Date Analyzed: 05/07/94 Sulfur Clean-up: Ν (Y/N)

 CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.92	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	2.0	
11096-82-5	Aroclor-1260	0.22	J

EPA SAMPLE NO. K40286F Lab Code: AQUAI Lab Name: Aquatec, Inc. SDG: ___ 91082 Case: BIO 40139 Contract: Phase Type: **BIOTA** Lab Sample ID: 215588 Phase Weight: 10.0 Date Received: 10/14/93 (g) 1.0 04/07/94 Injection Volume: (uL) Date Extracted: Dilution Factor: Date Analyzed: 5.0 05/07/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	ι
11104-28-2	Aroclor-1221	0.25	ι
11141-16-5	Aroclor-1232	0.25	
53469-21-9	Aroclor-1242	3.0	
12672-29-6	Aroclor-1248	0.25	l
11097-69-1	Aroclor-1254	3.4	
11096-82-5	Aroclor-1260	0.25	į

EPA SAMPLE NO.

Phase Type: Lab Sample ID: 215590 **BIOTA** Phase Weight: 10.0 Date Received: 10/14/93 (9) Injection Volume: 1.0 Date Extracted: 04/07/94 (uL) Dilution Factor: 5.0 Date Analyzed: 05/10/94

Lab Name: Aquatec, Inc.

Contract: _

91082

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.5	
11097-69-1	Aroclor-1254	0.89	
11096-82-5	Aroclor-1260	0.22	J

EPA SAMPLE NO. K40316F Lab Name: Aquatec, Inc. Lab Code: **IAUDA** 91082 Contract: Case: BIO SDG: 40139 Phase Type: **BIOTA** Lab Sample ID: 215592 Phase Weight: 10.0 Date Received: 10/14/93 (g) Injection Volume: 1.0 Date Extracted: 04/07/94 (uL) Dilution Factor: 5.0 Date Analyzed: 05/10/94 Sulfur Clean-up: _ N (Y/N)

CAS N	CAS NO. COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-	11-2 Aroclor-1016	0.25	U
11104-2	28-2 Aroclor-1221	0.25	J U
11141-	6-5 Aroclor-1232	0.25	U
53469-2	21-9 Arocior-1242	0.25	Jυ
12672-2	29-6 Aroclor-1248	0.25	U
11097-6	9-1 Aroclor-1254	1.9	
11096-8	32-5 Aroclor-1260	0.23	J

EPA SAMPLE NO. K40317F Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: __ 40139 Phase Type: **BIOTA** Lab Sample ID: 215594 Phase Weight: 10.0 **(g)** Date Received: 10/14/93 Injection Volume: _ 1.0 (uL) Date Extracted: 04/07/94 Dilution Factor: __ 2.0 Date Analyzed: 05/10/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
12674-11-2	Aroclor-1016	0.34	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Arocior-1232	0.10	U
53469-21-9	Arocior-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.81	
11096-82-5	Aroclor-1260	0.16	

EPA SAMPLE NO. K40322F Lab Code: Lab Name: Aquatec, Inc. AQUAI 91082 Case: BIO SDG: 40139 Contract: Phase Type: **BIOTA** Lab Sample ID: 215604 10.0 Phase Weight: 10/14/93 **(g)** Date Received: Injection Volume: 1.0 (uL) Date Extracted: 04/07/94 Dilution Factor: ___ 5.0 Date Analyzed: 05/10/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.71	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Arocior-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.6	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40325F Lab Code: _ Lab Name: Aquatec, Inc. AQUAI 91082 BIO SDG: 40139 Contract: _ Case: _ Phase Type: **BIOTA** Lab Sample ID: 215606 Phase Weight: _ 10.0 Date Received: 10/15/93 (g) 1.0 Injection Volume: (uL) Date Extracted: 04/07/94 05/16/94 5.0 Dilution Factor: Date Analyzed: Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Arocior-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	u
12672-29-6	Aroclor-1248	2.4	
11097-69-1	Aroclor-1254	1.4	
11096-82-5	Aroclor-1260	0.36	

PESTICIDE ANALYSES

<u>Introduction</u>

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. All samples were originally analyzed within the specified holding time. Samples K40270FRE, K40271FRE, K40272FRE, K40284FRE, K40322FRE and K40325FRE, were reanalyzed over the specified holding time. All data for the reanalyses have been qualified as estimated due to the deviation.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were above the acceptable control limits for both surrogates in samples K40270F, K40272F and K40322F. All detected compounds in these samples have been qualified as estimated due to the deviation. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40268F	Aldrin gamma-Chlordane 4,4'-DDE cis-Nonachlor	40.9% 81.8% 25.8% 40.4%
K40269F	Aldrin Heptachlor Epoxide gamma-Chlordane trans-Nonachlor Dieldrin 4,4'-DDT	55.6% 33.3% 77.8% 349.4% 181.8% 782.4%
K40270F	alpha-Chlordane cis-Nonachlor 4,4'-DDT	35.0% 38.5% 181.3%
K40270FRE	alpha-Chiordane trans-Nonachior cis-Nonachior 4,4'-DDT	25.3% 30.0% 75.9% 75.0%
K40271F	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin cis-Nonachlor 4,4'-DDT	37.6% 104.0% 168.8% 123.8% 178.6% 33.3% 615.8%

K40271FRE	Aldrin gamma-Chlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE cis-Nonachlor 4,4'-DDT	35.6% 92.3% 34.4% 202.6% 27.1% 73.9% 650.0%
K40272F	Aldrin Heptachlor Epoxide gamma-Chlordane trans-Nonachlor Dieldrin cis-Nonachlor 4,4'-DDT	54.0% 102.9% 88.9% 276.5% 136.4% 50.0% 653.8%
K40272FRE	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE Dieldrin	53.6% 107.1% 79.5% 29.0% 110.5%
K40273F	Aldrin gamma-Chlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE cis-Nonachlor	31.0% 133.3% 52.0% 262.1% 41.0% 52.8%
K40274F	gamma-Chlordane alpha-Chlordane trans-Nonachlor Dieldrin 4,4'-DDT	104.8% 36.8% 280.0% 120.0% 500.0%
K40275F	Aldrin gamma-Chlordane trans-Nonachlor Dieldrin 4,4'-DDT	31.6% 88.9% 178.6% 141.7% 494.1%
K40284F	Aldrin gamma-Chlordane trans-Nonachlor Dieldrin cis-Nonachlor 4,4'-DDT	36.0% 106.8% 171.4% 151.8% 33.3% 502.7%

K40284FRE	Aldrin	35.9%
	gamma-Chlordane	102.9%
	trans-Nonachlor	247.4%
	Dieldrin	100.0%
	cis-Nonachlor	29.2%
	4,4'-DDT	512.9%
K40285F	Aldrin	38.6%
	gamma-Chlordane	88.9%
	trans-Nonachlor	218.2%
	Dieldrin	183.3%
	cis-Nonachlor	100.0%
	4,4'-DDT	665.0%
K40286F	Aldrin	28.6%
	gamma-Chlordane	94.4%
	trans-Nonachlor	184.0%
	Dieldrin	136.0%
	4,4'-DDT	454.5%
K40315F	Aldrin	28.8%
	Heptachlor Epoxide	34.6%
	gamma-Chlordane	88.2%
	alpha-Chlordane	35.8%
	trans-Nonachlor	233.3%
	4,4'-DDE	28.6%
	Dieldrin	163.6%
	4,4'-DDT	682.6%
K40316F	Aldrin	62.7%
	gamma-Chlordane	66.7%
	trans-Nonachlor	353.1%
	4,4'-DDD	27.3%
	cis-Nonachlor	108.3%
	4,4'-DDT	718.8%
K40317F	Aldrin	41.2%
	gamma-Chlordane	80.9%
	cis-Nonachlor	70.7%
K40322F	Aldrin	44.0%
	gamma-Chlordane	96.2%
	trans-Nonachlor	264.3%
	4,4'-DDE	131.1%
	Dieldrin	180.0%
	4,4'-DDT	619.0%
K40322FRE	Aldrin	42.2%
,	gamma-Chlordane	86.7%
	trans-Nonachlor	338.4%
	cis-Nonachlor	38.5%
	4,4'-DDT	607.7%

K40325F	Heptachlor Epoxide gamma-Chlordane	31.9% 139.1%
	trans-Nonachlor	300.0%
	4,4'-DDE	39.7%
	cis-Nonachlor	47.4%
	4,4'-DDT	715.9%
K40325FRE	gamma-Chlordane	125.0%
	alpha-Chiordane	242.1%
	4,4'-DDE	50.0%
	Dieldrin	163.6%
	4,4'-DDT	682.6%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries of Aldrin were above the acceptable control limit in the matrix spike and matrix spike duplicate samples. The high recovery can be attributed to positive interference from PCBs present in the matrix spike. All other recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. Matrix spike recoveries were with acceptable control limits for the matrix spike blank (MSB) sample. No qualifiers were added to the samples based on matrix spike performance.

8. General Comments

Elevated surrogate recoveries in the initial analyses of samples K40270F, K40271F, K40272F, K40284F, K40322F and K40325F suggested possible sample extract evaporation. The reanalyses of the archived aliquot had acceptable surrogate recoveries. The data from the reanalyses of these samples should be used for all compounds.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u> </u>		
Are the samples numbers included in the narrative?	x		
Are the sample chain-of-custodies present?	<u> </u>		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		<u></u>	
Holding Times	•		
Have any holding times been exceeded?	X		
Surrogate Recovery			
Are the surrogate recovery forms present?	<u> </u>		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	<u>x</u>		
If yes, were the samples reanalyzed?	X		
Were the method blanks reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	<u> </u>		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
out of8			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
Is the method blank summary form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u></u>		
Do any method/reagent/instrument blanks have positive results?		×	
Do any trip/field/rinse blanks have positive results?			Х
Are there field/rinse/equipment blanks associated with every sample?		x	
Calibration and GC Performance			
Are the following chromatograms and data printouts preblanks, and MS/MSD?	esent for a	ıli samples	3
peak resolution check	<u> x</u>		
performance evaluation mixtures (BCS)	<u> </u>		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	x		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	x		
is Form VII-1 present for each BCS analyzed for both columns?	x		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		x	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	x		
Is Form VII-2 present and complete for each mid-point standard analyzed?	x		
Are RPD values for all compounds < 25%?	X		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Analytical Sequence Check			
Is Form VIII present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
Is Form IX-1 present for each lot of Florisil cartridges used?	x		
Are all samples listed on the form?	X		
If GPC cleanup was performed, is Form IX-2 present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	X		
GPC calibration (80-110%)			X
Pesticide/PBB Identification			
Is a Form X present for every sample in which a pesticide or PCB was detected?	x		
Was GC/MS confirmation provided when required?			X
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?		x	
Were there any false negatives?		×	
Compound Quantitation and Reported Detection Limit	ls.		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality		·	
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		×	
Field Duplicates			
Where field duplicates submitted with the samples?		X	

Pesticide/PBB Qualifier Summary Holding Time and Surrogates

Sample ID	Holding	Surrogates	- Column 1	Surrogates	- Column 2
	Time	TOX	DCB	TCX	DGB
K40268F					
K40269F					
K40270F		† (211)	† (189)	† (222)	† (185)
K40270FRE	+7				
K40271F					
K40271FRE	+7				
K40272F		† (191)	† (172)	† (198)	† (171)
K40272FRE	+7				
K40273F					
K40274F					
K40275F					
K40284F					
K40284FRE	+8		_		
K40285F					
K40286F					
K40315F	,				
K40316F					
K40317F					
K40322F		† (157)	† (158)	† (161)	† (153)
K40322FRE	+7				
K40325F					
K40325FRE	+8				
K40325FMSRE	+8				
K40325FMSDRE	+8				

Surrogates: TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogate diluted out

Recovery high Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: <u>HP2404</u>
Column: <u>RTX-5</u>

Date:	5/6/94	5/10	5/10	5/10			
Time:	17:57	02:55	11:15	20:58			
	Initial Cal.	Cont. Cat.	Cont. Cal.	Cont. Cal.	Cont. Celi	Cont. Cal.	Cont. Cal.
,	%ASD	%D	%0	% D	% D	%D	% D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl		 					
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide						:	
gamma-Chlordane							
aipha-Chlordane							
trans-Nonachior							
4,4'-DDE	·						
Dieldrin							···
4,4'-DDD							
cis-Nonachlor							· · · · · · · · · · · · · · · · · · ·
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							×
Tetrachioro-m-xylene					6		
Decachlorobiphenyl			×				· · · · · ·
Affected Samples:							
Γ							

Pesticide/PBB Calibration Summary - Page 2

Instrument: <u>HP2404</u>
Column: <u>RTX-35</u>

Date:	5/6/94	5/10	5/10	5/10			
Time:	17:57	02:55	11:15	20:58			
•	initial Cal.	Cont. Cal.	Cont.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	% D	%D	% D	*0	% D	% D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chiordane						 	
alpha-Chiordane							
trans-Nonachior							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachioro-m-xylene					S is		
Decachlorobiphenyl							
Affected Samples:							<u> </u>
[
{							
Γ							

Instrument: <u>HP2404</u>
Column: <u>RTX-5</u>

Date:	5/12/94	5/13					
Time;	17:54	08:10					
	initial Cal.	Cont. Cal.	Cont. Cal.	Gont. Cal.	Cont. Cal.	Cont. Cal	Cont. Cal:
·	%ASD	% D	% D	% D	% D	%D	%D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl					<u> </u>		
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)	_						
Aldrin							
Heptaclor epoxide							
gamma-Chlordane					<u> </u>		
alpha-Chiordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachior							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene			·				
Tetrachioro-m-xylene					<u> </u>		
Decachiorobiphenyl							
Affected Samples:							
Ī							

Instrument: <u>HP2404</u>
Column: <u>RTX-35</u>

Dale:	5/12/94	5/13					
Time:	17:57	08:10					
1	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%ASD	% 0	% D	% D	% 0	%D	% D
2-Bromobiphenyl	ok	ok					
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)						ļ	
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachior							
4,4'-DDE					<u> </u>		
Dieldrin							
4,4'-DDD		: 				ļ	
cis-Nonachlor							
4,4'-DDT						ļ	
Hexabromobiphenyl (BP-6)			<u>.</u>				
Toxaphene							
Tetrachioro-m-xylene			-		ø.		
Decachlorobiphenyl		·					
Affected Samples:							
[
Ī							

Instrument: <u>HP2404</u> Column: <u>RTX-5</u>

Date;	5/17/94	5/24	5/25	5/25			
Time:	17:19	09:01	00:48	08:33			
	initial Cal	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	% 0	% D	%D	% D	% D	% D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl						<u> </u>	
4-Bromobiphenyl							
Hexachiorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachior							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT					<u> </u>	<u></u>	
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene					6		
Decachlorobiphenyl							
Affected Samples:							
[

Instrument: <u>HP2404</u>
Column: <u>RTX-35</u>

Date:	5/17/94	5/24	5/25	5/25			
Time:	17:19	09:01	00:48	08:33			
•	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	% D	%D	%0	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl			_				
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin						P	-
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachior							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachior							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene					*		
Decachlorobiphenyl							
Affected Samples:							
[

Corrected Sample Analysis Data Sheets

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40268F

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215570

 Date Received:
 10/13/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/10/94

 Sulfur Clean-up:
 N

SDG:

		· · · · · · · · · · · · · · · · · · ·	
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.022	7
1024-57-3	Heptachlor Epoxide	0.011	
5103-74-2	gamma-Chlordane	0.0066	NT
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.031	丁 丁
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.0057	75
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U _
8001-35-2	Toxaphene	0.20	U

 Lab Name:
 Aquatec, Inc.
 K40269F

 Lab Code:
 AQUAI
 AQUAI

 Contract:
 91082
 SDG:
 40139

 Case:
 BIO
 SDG:
 215572

 Chase Type:
 Biota
 Date Received:
 10/13/93

Client ID No.

		rap Sample ID:	2100/2
Phase Type:	Biota	Date Received:	10/13/93
Phase Weight:	10.0 g	Date Extracted:	04/07/94
Extraction:	Soxhlet	Date Analyzed:	05/10/94
Dilution Factor:	1.0	Sulfur Clean-up:	N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.054	IN
1024-57-3	Heptachlor Epoxide	0.021	丁
5103-74-2	gamma-Chlordane	0.018	JN
5103-71-9	alpha-Chlordane	0.0079	
39705-80-5	trans-Nonachlor	0.0089	
72-55-9	4,4'-DDE	0.11	
60 57 1	Dieldrin	0.011	
72-54-8	4,4'-DDD	0.037	
5103-73-1	cis-Nonachlor	0.021	
50-29-3	4,4'-DDT	0.017	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.

SDG: 40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215574R1

 Date Received:
 10/13/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/24/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	υJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	しけ
58-89-9	gamma-BHC	0.0050	U.J
309-00-2	Aldrin	0.014	ナ
1024-57-3	Heptachlor Epoxide	0.013	5
5103-74-2	gamma-Chlordane	0.0086	5
5103-71-9	alpha-Chlordane	0.0079	7
39765-80-5	trans-Nonachlor	0.010	J
72-55-9	4,4'-DDE	0.085	
60-57-1	Dieldrin	0.010	7
72-54-8	4,4'-DDD	0.025	7
5103-73-1	cis-Nonachlor	0.0054	JN
50-29-3	4,4'-DDT	0.012	ブル
36355-01-8	Hexabromobiphenyl	0.020	UJ
8001-35-2	Toxaphene	0.20	リナ

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.

SDG: 40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215576R1

 Date Received:
 10/13/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/24/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	UJ
92-66-0	4-Bromobiphenyl	0.010	UJ
118-74-1	Hexachlorobenzene	0.0050	UJ
58-89-9	gamma-BHC	0.0050	UJ
309-00-2	Aldrin	0.045	
1024-57-3	Heptachlor Epoxide	0.023	7
5103-74-2	gamma-Chlordane	0.013	
5103-71-9	alpha-Chlordane	0.0064	J
39765-80-5	trans-Nonachlor	0.0076	
72-55-9	4,4'-DDE	0.059	丁
60-57-1	Dieldrin	0.010	U.J
72-54-8	4,4'-DDD	0.027	J
5103-73-1	cis-Nonachlor	0.0069	JN
50-29-3	4,4' DDT	0.010	
36355-01-8	Hexabromobiphenyl	0.020	U,J
8001-35-2	Toxaphene	0.20	UT

Client ID No. K40272FRE Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 Contract: BIO Case: SDG: 40139 Lab Sample ID: 215578R1 Phase Type: **Biota** Date Received: 10/13/93 Phase Weight: 10.0 Date Extracted: 04/07/94 Extraction: Soxhlet Date Analyzed: 05/24/94 Dilution Factor: 1.0 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	UJ	
2113-57-7	3-Bromobiphenyl	0.010	UJ	
92-66-0	4-Bromobiphenyl	0.010	UJ	
118-74-1	Hexachlorobenzene	0.0050	UJ	
58-89-9	gamma-BHC	0.0050	UĴ	
309-00-2	Aldrin	0.028	NE	
1024-57-3	Heptachlor Epoxide	0.014		-R
5103-74-2	gamma-Chlordane	0.0078	NT	
5103-71-9	alpha-Chlordane	0.0050	UJ	
39765-80-5	trans-Nonachlor	0.0050	UJ	
72-55-9	4,4'-DDE	0.031	ナ	•
60-57-1	Dieldrin	0.010	U	-R
72-54-8	4,4'-DDD	0.013	T	•
5103-73-1	cis-Nonachlor	0.0050	UT	
50-29-3	4,4'-DDT	0.010	UJ	
36355-01-8	Hexabromobiphenyl	0.020	リテ	
8001-35-2	Toxaphene	0.20	UJ	

 Lab Name:
 Aquatec, Inc.
 K40273F

 Lab Code:
 AQUAI
 Contract:
 91082

 Case:
 BIO
 SDG:
 40139

 Lab Sample ID:
 215580

Client ID No.

Phase Type: **Biota** Date Received: 10/13/93 Phase Weight: 10.0 Date Extracted: 04/07/94 Extraction: Soxhlet Date Analyzed: 05/10/94 Dilution Factor: 1.0 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.058	J	
1024-57-3	Heptachlor Epoxide	0.035		
5103-74-2	gamma-Chlordane	0.012		-R
5103-71-9	alpha-Chlordane	0.0050	77	
39765-80-5	trans-Nonachler	0.0058		-R
72-55-9	4,4'-DDE	0.039	ज ी	•
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.017		
5103-73-1	cis-Nonachlor	0.0072	\d_	
50-29-3	4,4'-DDT	0.010	U	
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40274F

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215582

 Date Received:
 10/13/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/13/94

 Sulfur Clean-up:
 N

SDG:

COMPOUND	CONCENTRATION (mg/Kg)	a	
2-Bromobiphenyl	0.010	U	
3-Bromobiphenyl	0.010	U	
4-Bromobiphenyl	0.010	U	
Hexachlorobenzene	0.0050	U	
gamma-BHC	0.0050	U	
Aldrin	0.072		
Heptachlor Epoxide	0.048		
gamma Chlordane	0.021		⊢R
alpha-Chlordane	0.0095	7	
trans-Nonachier	0.010		-R
4,4'-DDE	0.099		1
Dieldrin	0.015		-R
4,4'-DDD	0.036		\ \ \
cis-Nonachlor	0.018		
4.4' DDT	0.019		R
Hexabromobiphenyl	0.020	U	'``
Toxaphene	0.20	U	1
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gamma Chlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	(mg/Kg)	Comp/Kg Comp/Kg

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40275F

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 215584

Date Received: 10/13/93

Date Extracted: 04/07/94

Date Analyzed: 05/13/94

Sulfur Clean-up: N

SDG: _

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	α
2052-07-5	2-Bromobiphenyl	0.010	υ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	Ū
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.057	7
1024-57-3	Heptachlor Epoxide	0.034	
5103-74-2	gamma-Chlordane	0.018	JN
5103-71-9	alpha-Chlordane	0.011	
39765 80 5	trans Nonachior	0.014	
72-55-9	4,4'-DDE	0.10	
60 57 1	Dieldrin	0.012	
72-54-8	4,4'-DDD	0.036	
5103-73-1	cis-Nonachlor	0.018	
50-29-3	4,4'-DDT	0.017	
36355-01-8	Hexabromobiphenyl	0.020	Ú
8001-35-2	Toxaphene	0.20	Ū

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 2.0

 Lab Sample ID:
 215622R1

 Date Received:
 10/13/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/25/94

 Sulfur Clean-up:
 N

SDG:

	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
	2052-07-5	2-Bromobiphenyl	0.020	U 7	
	2113-57-7	3-Bromobiphenyl	0.020	U.5	
	92-66-0	4-Bromobiphenyl	0.020	UJ	
	118-74-1	Hexachlorobenzene	0.010	UJ	
	58-89-9	gamma-BHC	0.010	US	
	309-00-2	Aldrin	0.12	J	
	1024-57-3	Heptachlor Epoxide	0.069	5	
	5103-74-2	gamma Chlordane	0.034		-R
	5103-71-9	alpha-Chiordane	0.017	7	
	39765-80-5	trans Nonachior	0.019		-R
	72-55-9	4,4'-DDE	0.16	J	
\vdash	60 57 1	Dieldrin	0.025		_£
	72-54-8	4,4'-DDD	0.052	7	
	5103-73-1	cis-Nonachlor	0.024	<u> </u>	
	50-29-3	4,4'-DDT	0.031		-R
Г	36355-01-8	Hexabromobiphenyl	0.040	UJ	
	8001-35-2	Toxaphene	0.40	UT	

 Lab Name:
 Aquatec, Inc.
 K40285F

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40139

 Lab Sample ID:
 215586

 Phase Type:
 Biota
 Date Received:
 10/14/93

Client ID No.

		Lab Sample IU:	213300
Phase Type:	Biota	Date Received:	10/14/93
Phase Weight:	10.0 g	Date Extracted:	04/07/94
Extraction:	Soxhlet	Date Analyzed:	05/10/94
Dilution Factor:	1.0	Sulfur Clean-up:	N
		•	

COMPOUND	CONCENTRATION (mg/Kg)	Q
2-Bromobiphenyl	0.010	U
3-Bromobiphenyl	0.010	U
4-Bromobiphenyl	0.010	U
Hexachlorobenzene	0.0050	U
gamma-BHC	0.0050	U
Aldrin	0.057	
Heptachlor Epoxide	0.030	
gamma-Chlordane	0.018	JN
alpha-Chlordane	0.0095	
trans Nonschlor	0.011	R
4,4'-DDE	0.096	
Dieldrin	0.012	
4,4'-DDD	0.044	
cis-Nonachlor	0.017	
4,4' DDT	0.020	
Hexabromobiphenyl	0.020	U
Toxaphene	0.20	U
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gamma-Chlordane alpha-Chlordane trans Nensehler 4,4'-DDE Dieldrin 4,4'-DDD eis-Nensehler 4,4'-DDT Hexabromobiphenyl	Comp/Kg Comp/Kg

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.
K40286F

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215588

 Date Received:
 10/14/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/13/94

 Sulfur Clean-up:
 N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.10	-XEJ	
1024-57-3	Heptachlor Epoxide	0.066		
-5103 74 2	-gamma-Chlordane	0.036		-R
5103-71-9	alpha-Chlordane	0.021		!
39765-80-5	trans Nonachior	0.025		-R
72-55-9	4,4'-DDE	0.17	*EJ	
60 57 1	Dieldrin	0.025		ŀR
72-54-8	4,4'-DDD	0.076		
5103-73-1	cis-Nonachlor	0.034	I	Ì
50-29-3	4,4'-DDT	0.033		HR
36355-01-8	Hexabromobiphenyl	0.020	U	,
8001-35-2	Toxaphene	0.20	U	1

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40315F

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 215590

Date Received: 10/14/93

Date Extracted: 04/07/94

Date Analyzed: 05/10/94

Sulfur Clean-up: N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.059	7	
1024-57-3	Heptachlor Epoxide	0.026	7	
5103-74-2	gamma-Chiordane	0.017	NŢ	
5103-71-9	alpha-Chlordane	0.0067		_
30765-80-5	trans-Nonachlor	0.0093		-R
72-55-9	4,4'-DDE	0.070	J	
60-57-1	Dieldrin	0.011		- K
72-54-8	4,4'-DDD	0.026		•
5103-73-1	cis-Nonachlor	0.019		
50-29-3	4,4' DDT	0.014		-R
36355-01-8	Hexabromobiphenyi	0.020	U	•
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.
K40316F

40139

N

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

1.0

Dilution Factor:

Lab Sample ID: 215592

SDG:

Sulfur Clean-up:

-

Date Received: 10/14/93

Date Extracted: 04/07/94

Date Analyzed: 05/10/94

CAS NO.	COMPOUND	CONCENTRATION	a
		(mg/Kg)	
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.035	JN
1024-57-3	Heptachlor Epoxide	0.015	
5103-74-2	gamma-Chlordane	0.015	JN
5103-71-9	alpha-Chlordane	0.0050	. U
39765-80-5	trans-Nonachior	0.0064	
72-55-9	4,4'-DDE	0.065	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	J
5103-73-1	eis-Nonechlor	0.012	
50 29 3	4,4' DDT	0.016	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	Ū

		Cau Sample ID.	213334
Phase Type:	Biota	Date Received:	10/14/93
Phase Weight:	10.0 g	Date Extracted:	04/07/94
Extraction:	Soxhlet	Date Analyzed:	05/10/94
Dilution Factor:	1.0	Sulfur Clean-up:	N
		, –	

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	υ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	υ
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.031	J
1024-57-3	Heptachlor Epoxide	0.014	
5103-74-2	gamma-Chlordane	0.0094	NT
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.043	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.011	
5103-73-1	cis-Nonachlor	0.0082	JN:
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215604R1

 Date Received:
 10/14/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/24/94

 Sulfur Clean-up:
 N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	07	
2113-57-7	3-Bromobiphenyl	0.010	UJ	
92-66-0	4-Bromobiphenyl	0.010	UJ	
118-74-1	Hexachlorobenzene	0.0050	UJ	
58-89-9	gamma-BHC	0.0050	UJ	
309-00-2	Aldrin	0.045		
1024-57-3	Heptachlor Epoxide	0.025		
5103-74-2	gamma-Chlordane	0.015	JN	
5103-71-9	alpha-Chlordane	0.0069	丁丁	
39765-80-5	trans-Nonachlor	0.0073		R
72-55-9	4,4'-DDE	0.066	T	' '
60-57-1	Dieldrin	0.010	UJ	
72-54-8	4,4'-DDD	0.021	5	
5103-73-1	cis-Nonachlor	0.013	J J	
50-29-3	4,4'-DDT	0.013		-6
36355-01-8	Hexabromobiphenyl	0.020	UJ	
8001-35-2	Toxaphene	0.20	UJ	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No.

SDG: 40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215606R1

 Date Received:
 10/15/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/25/94

 Sulfur Clean-up:
 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	υJ	
2113-57-7	3-Bromobiphenyl	0.010	υJ	
92-66-0	4-Bromobiphenyl	0.010	บปี	
118-74-1	Hexachlorobenzene	0.0050	UJ	
58-89-9	gamma-BHC	0.0050	UJ	
309-00-2	Aldrin	0.065	7	
1024-57-3	Heptachlor Epoxide	0.034	J	
5103-74-2	gamma-Chiordane	0.016		R
5103 71 0	alpha Chlordane	0.0076		R
39765-80-5	trans-Nonachior	0.0050	UJ	`
72-55-9	4,4'-DDE	0.046	7	1
60-57-1	Dieldrin	0.010	リブ]
72-54-8	4,4'-DDD	0.013	5	
5103-73-1	cis-Nonachlor	0.011	NE]
50 20 3	4,4'-DDT	0.015		1R
36355-01-8	Hexabromobiphenyl	0.020	LU]
8001-35-2	Toxaphene	0.20	UJ]

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

One of the CRDL recoveries was above acceptable limits. No data fell in the affected range; therefore, no data qualification was necessary.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u>X</u>		
Are the sample numbers included in the narrative?	x		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	<u> </u>		
SDG No.?	<u> </u>		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			<u> </u>
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	X		
Is the data properly labeled?	X		
Holding Times			
Were mercury analyses performed within 28 days?	X		

	YES	NO	NA
Were cyanide distillations performed within 14 days?			X
Were other metal analysis performed within 6 months?			X
Form I (Final Data)			
Are all forms complete?	X		
Are correct units indicated on Form I's?	X		
Are all "less than IDL" values properly coded with "U"?	X		
Are the correct concentration qualifiers used with final data?	X		
Was a brief physical description of samples given on Form I's?		X	
Calibration			
Is a record of at least 2 point calibration present for ICP analysis?			X
is a record of 5 point calibration present for Hg analysis?	. <u> </u>		
Is a record of 4 point calibration present for:			
Flame AA?			X
Furnace AA?			X
Cyanides?			X
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?			· X
Is correlation coefficient less than .995 for:			
Mercury Analysis?	X		
Cyanide Analysis?			X
Atomic Absorption Analysis?			X
Form II A (initial and Continuing Calibration Verifica	tion)		
Present and complete for every metal and cyanide?	X		
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?			<u> </u>
Hg (80-120 %R)?	X		
Cyanides (85-115 %R)?			×

	YES	NO	NA_
Was continuing calibration performed every 10 samples or every 2 hours?	X	<u> </u>	
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Wàs a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	×		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL < CRDL) less than or equal to the Contract Required Detection Limits (CRDLs)?			
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			X
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	x	<u>. </u>	
each batch of digested samples?	x		
each matrix type?			
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		×	

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			×
Is concentration of prep. blank below the negative CRDL?		X	
Form IV (ICP Interference Check Sample)			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits (±20%)?			X
If no, is concentration of AI, Ca, Fe, or Mg lower than the respective concentration in ICS?			×
Form V A (Spiked Sample Recovery - Pre-Digestion/F	Pre-Distil	iation)	
Present and complete for:			
each SDG?	X		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?	X		
If no, is sample concentration greater than or equal to four times spike concentration?			X
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?			X
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?		X	
between 126-200%?		X	
greater than 200%?		X	
Form VI (Lab Duplicates)			
Present and complete for:			
each SDG?	X		

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			×
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		. X	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
Form VII (Laboratory Control Sample)			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
Form IX (ICP Serial Dilution)		·	
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E"" on Form I's and Form IX when initial concentration of Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			·
> 10%?			X
≥100%?			×
Furnace Atomic Absorption (AA) QC Analysis			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA?			X

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?		·	X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?			X
is analytical spike recovery outside the control limits (85-115%) for any sample?			X
Form VIII (Method of Standard Addition Results)			
Present?		X	
If no, is any Form I result coded with "S" or a "+"?		X	
Is coefficient of correlation for MSA less than 0.990 for any sample?			X
Was MSA required for any sample but not performed?		X	
Is coefficient of correlation for MSA less than 0.995?			X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?			x
Was proper quantitation procedure followed as outlined in the SOW on page E-23?			X
Field Blank			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?			X
If no, was field blank value already rejected due to other QC criteria?			X
Form X, XI, XII (Verification of Instrumental Parameter	ers)		
Is verification report present for :			
Instrument Detection Limits (quarterly)?	X		
ICP Interelement Correlation Factors (annually)?			X
ICP Linear Ranges (quarterly)?			X
Form X (Instrument Detection Limits)		<u> </u>	
Are IDLs present for:			
all the analytes?	X		
all the instruments used?	X		

	YES	NO	NA.
is IDL greater than CRDL for any analyte?		X	
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.			X
Was any sample result higher linear range of ICP.			X
Was any sample result higher than the highest calibration standard for non-ICP parameters?		X	
If yes for any of the above, was the sample diluted to obtain the result on Form !?			×

Corrected Sample Analysis Data Sheets

U.S. EPA - CLP

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		INORGANIC .	Analyses data	SHEET	
o Name: AQUA	: AQUATEC Contract: 91082			K40268F	
Lab Code: AQUA	I Ca	se No.: BI	O SAS No.	:	_ SDG No.: 40139_
					mple ID: 215570
Matrix (soil/w	vater): risn			Tan Sa	mple 10. 213370
Level (low/med	l): LOW_			Date R	eceived: 10/13/93
% Solids:	100.	0			
· Co	ncentration	Units (ug	/L or mg/kg dry	y weigh	t): MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-	- NR
	7440-36-0	Antimony_			NR
	7440-38-2	Arsenic		_	NR
	7440-39-3 7440-41-7	Barium Beryllium		-	NR NR
•	7440-41-7	Cadmium		-	$-\frac{NR}{NR}$
	7440-70-2	Calcium		-	- NR
	7440-47-3	Chromium		-	- NR
	7440-48-4	Cobalt -		-	NR
	7440-50-8	Copper			NR
	7439-89-6	Iron			NR
	7439-92-1	Lead		l-l	NR NR
	7439-95-4 7439-96-5	Magnesium Manganese			NR NR
	7439-97-6	Mercury	0.10	-	- cv
	7440-02-0	Nickel -		-	NR
•	7440-09-7	Potassium		-	NR
•	7782-49-2				NR
	7440-22-4			_	NR
	7440-23-5	Sodium		-	NR NR
	7440-28-0 7440-62-2	Thallium_ Vanadium		-	NR NR
	7440-62-2	Zinc Zinc		-	- NR
		Cyanide		-	- NR
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					

FORM I - IN

ILM02.1

INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
-----	--------	-----

LOW	its (ug nalyte uminum_ timony_ senic_ rium ryllium licium romium_ oalt_ oper	/L or mg/kg o	o.:	Lab Date	Sampl Rece	SDG e ID: ived: MG/I M NR NR NR NR NR NR NR NR NR NR NR NR NR N	: 2155° : 10/1	40139 _.
Case 1 : FISH_ LOW	its (ug nalyte uminum_ timony_ senic_ rium ryllium licium romium_ oalt_ oper	/L or mg/kg o	I dry	Cab Date Wei	Sampl Rece	MG/I	: 2155° : 10/1	72
LOW	its (ug	/L or mg/kg (I dry	Cab Date Wei	Sampl Rece	MG/I	: 2155° : 10/1	72
100.0 ration Uni No. Ar -90-5 -36-0 Ant -38-2 Ars -39-3 Bar -41-7 Ber -43-9 Cad -70-2 Cal -47-3 Chr -50-8 Cop	nalyte uminum_ timony_ senic_ rium_ ryllium dmium_ lcium_ romium_ oalt_ oper	Concentration	dry	wei	ght):	MG/I M NR NR NR NR NR NR NR NR NR NR	·	3/93
No. Ar -90-5 Alu -36-0 Ant -38-2 Ars -39-3 Bar -41-7 Cad -70-2 Cal -43-9 Cal -70-2 Chr -48-4 Coh -50-8 Cop	nalyte uminum_ timony_ senic_ rium_ ryllium dmium_ lcium_ romium_ oalt_ oper	Concentration		т	Q	M NR NR NR NR NR NR NR NR	k G	
No. Ar -90-5 Alu -36-0 Ant -38-2 Ars -39-3 Bar -41-7 Ber -43-9 Cad -70-2 Cal -47-3 Chr -48-4 Coh	nalyte uminum_ timony_ senic_ rium_ ryllium dmium_ lcium_ romium_ oalt_ oper	Concentration		т	Q	M NR NR NR NR NR NR NR NR	K G	
-90-5 Alu-36-0 Ant -38-2 Ars -39-3 Bar -41-7 Cad -70-2 Cal -47-3 Chr -50-8 Cop	uminum_timony_senic_rium_ryllium lmium_lcium_romium_oalt_		on 0			NR NR NR NR NR NR NR NR		
-36-0 Ant -38-2 Ars -39-3 Bar -41-7 Ber -43-9 Cad -70-2 Cal -47-3 Chr -48-4 Coh	timony_ senic_ rium_ ryllium dmium_ lcium_ romium_ oalt oper_					NR NR NR NR NR NR NR		
-36-0 Ant -38-2 Ars -39-3 Bar -41-7 Ber -43-9 Cad -70-2 Cal -47-3 Chr -48-4 Coh	timony_ senic_ rium_ ryllium dmium_ lcium_ romium_ oalt oper_					NR NR NR NR NR NR NR		
-38-2 Ars -39-3 Bar -41-7 Ber -43-9 Cad -70-2 Cal -47-3 Chr -48-4 Cob -50-8 Cop	senic_ rium ryllium dmium_ lcium romium oalt_ oper					NR NR NR NR NR		
-41-7 Ber -43-9 Cad -70-2 Cal -47-3 Chr -48-4 Coh	ryllium dmium_ lcium_ romium_ oalt oper_					NR NR NR NR		
-43-9 Cad -70-2 Cal -47-3 Chr -48-4 Cob -50-8 Cop	dmium_ lcium_ romium_ palt oper					NR NR NR NR		
-70-2 Cal -47-3 Chr -48-4 Cob -50-8 Cop	lcium_ romium_ palt pper					NR NR NR		
-47-3 Chr -48-4 Cob -50-8 Cop	romium_ palt_ pper_					NR NR		
-48-4 Cob -50-8 Cop	palt		_ -			NR		
-50-8 Cop	per				[•	
				1		NR		
				-		NR	•	
-92-1 Lea			-	-		NR		
	nesium		-	-	}	NR		
	nganese		-	-		NR	• • •	
	cury	0.0	09 -	-		CV		
-02-0 Nic	ckel		_			NR		
			_					
			1-	_				
				_				
				-				
				-1				
				-]				
				-				
			[-	-[MA		
	Clarit	ty Before: _				Text	ure:	
	Clarit	ty After: _		<u> </u>		Arti:	facts:	
	-02-0 Nic -09-7 Pot -49-2 Sel -22-4 Sil -23-5 Soc -28-0 That -62-2 Var -66-6 Zir Cya	Nickel -09-7 Potassium -49-2 Selenium -22-4 Silver -23-5 Sodium -28-0 Thallium -62-2 Vanadium - Zinc - Cyanide - Clarie	Nickel Potassium Selenium Selenium Potassium P	-02-0 Nickel	-02-0 Nickel -09-7 Potassium -49-2 Selenium -22-4 Silver -23-5 Sodium -28-0 Thallium -62-2 Vanadium -66-6 Zinc	-02-0 Nickel -09-7 Potassium -49-2 Selenium -22-4 Silver -23-5 Sodium -28-0 Thallium -62-2 Vanadium -66-6 Zinc -Cyanide Clarity Before:	-02-0 Nickel NR -09-7 Potassium NR -49-2 Selenium NR -22-4 Silver NR -23-5 Sodium NR -28-0 Thallium NR -62-2 Vanadium NR -66-6 Zinc NR -Cyanide Text	O2-0 Nickel NR O9-7 Potassium NR A49-2 Selenium NR O22-4 Silver NR O23-5 Sodium NR O28-0 Thallium NR O62-2 Vanadium NR OCyanide NR Clarity Before: Texture:

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
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		THOUGHNIC Y	WANTIDED DUTU	21100+	l ————————————————————————————————————
Nome: AOII	y w E C		Contract: 93	1082	K40270F
					·
ab Code: AQU	AI_ Ca	se No.: BI	SAS No.	·	SDG No.: 40139
atrix (soil/	water): FISH			Lab Samp	ole ID: 215574
evel (low/med	d): LOW_	_		Date Rec	eived: 10/13/93
Solids:	100.	0			
C	oncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-	NR
	7440-36-0	Antimony			NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium -			NR
	7440-41-7	Beryllium			NR
	7440-43-9	Cadmium_			NR
	7440-70-2				NR
	7440-47-3	Chromium			NR
	7440-48-4	Cobalt			NR
	7440-50-8	Copper			NR
	7439-89-6	Iron			NR
	7439-92-1	Lead		-	NR
	7439-95-4	Magnesium		-	NR
•	7439-96-5	Manganese		-	NR
	7439-97-6	Mercury	0.13	_ -	CV
	7440-02-0 7440-09-7	Nickel Potassium			- NR
	7782-49-2	Selenium			NR NR
	7440-22-4	Silver			- NR
	7440-23-5	Sodium		-	- NR
	7440-28-0	Thallium		-	NR
	7440-62-2	Vanadium_		-	NR
	7440-66-6	Zinc		-	NR
		Cyanide		-	NR
olor Before:		Clarit	y Before:		Texture:
olor After:		Clarit	y After:		Artifacts:
omments:					
					

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

					·
ab Name: AQUA	TEC	•	Contract: 9	1082	K40271F
		_	SAS No.	•	SDG No.: 40139_
Matrix (soil/w					ole ID: 215576
Tana) (1an/mad	\. TOW			Data Pac	ceived: 10/13/93
Level (low/med): LOW			Date Rec	.e.veu. 10/13/93
% Solids:	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG
,	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-	NR
	7440-36-0	Antimony -			NR
	7440-38-2	Arsenic			NR
	7440-39-3 7440-41-7	Barium Beryllium			NR NR
	7440-41-7			-	- NR
	7440-70-2			-	NR
	7440-47-3	Chromium			NR
;	7440-48-4	Cobalt			NR
	7440-50-8	Copper			NR
	7439-89-6	Iron		_ -	NR
	7439-92-1 7439-95-4	Lead Magnesium		-	NR NR
<u>.</u>	7439-95-4	Manganese		-	- NR
	7439-97-6	Mercury	0.08	-	- cv
	7440-02-0	Nickel		-	NR)
	7440-09-7	Potassium			NR
•	7782-49-2	Selenium_			NR
	7440-22-4	Silver			NR
	7440-23-5 7440-28-0	Sodium		-	NR NR
	7440-62-2	Vanadium			- NR
	7440-66-6	Zinc		-	NR
	[Cyanide			NR
	l				_
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					

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1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

	INONGMITC I	WALISES DAIR S	1111111	
None ACHAREC		Contract: 91	1082	K40272F
o Name: AQUATEC	·	Concrace. 7.		-
ab Code: AQUAI_ Ca	ase No.: BIO	SAS No.:	<u> </u>	SDG No.: 40139
atrix (soil/water): FIS	<u>-</u>		Lab Samp	ple ID: 215578
evel (low/med): LOW_			Date Red	ceived: 10/13/93
Solids: 100	. 0			
Concentration	units (ug	/L or mg/kg dry	y weight)	: MG/KG
CAS No.	Analyte	Concentration	C Q	м
7429-90-5	Aluminum			- NR
7440-36-0			-	NR
7440-38-2				NR
7440-39-3	Barium]NR]
7440-41-7				NR
7440-43-9				NR
7440-70-2				NR
7440-47-3				NR
7440-48-4	1			NR
7440-50-8	Copper			NR
7439-89-6	Iron			NR
7439-92-1	Lead		-	NR
7439-95-4 7439-96-5	Magnesium Manganese		_	NR NR
7439-98-5	Mercury	0.06		- CV
7440-02-0	Nickel -			- NR
7440-09-7	Potassium		-	- NR
7782-49-2	Selenium		-	NR
7440-22-4	Silver		- - 	NR
7440-23-5			-	NR
7440-28-0	Thallium		-	NR
7440-62-2	Vanadium		-	NR
7440-66-6	Zinc -		[NR
	Cyanide			NR
\	. 1	l	l _ l	_
olor Before:	Clarit	cy Before:	 -	Texture:
olor After:	Clarit	y After:		Artifacts:
omments:				

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		INONGALIC .	WINDIDED DATA	J1121212	
b Name: AQUA	ATEC		Contract: 9	1082	K40273F
_					SDG No.: 40139_
Matrix (soil/v	_				le ID: 215580
(,	•	-		_	
Level (low/med	l): LOW_	_		Date Rec	eived: 10/13/93
% Solids:	100.	0			
Co	oncentration	Units (ug	/L or mg/kg dry	y weight):	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-	NR
	7440-36-0	Antimony		-	NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium			NR
	7440-41-7	Beryllium			NR
	7440-43-9	Cadmium			NR
	7440-70-2	Calcium			NR
	7440-47-3	Chromium_			NR
	7440-48-4 7440-50-8	Cobalt			NR NR
	7439-89-6	Copper			NR
	7439-92-1	Lead			NR
•	7439-95-4	Magnesium			NR -
	7439-96-5	Manganese		-	NR
	7439-97-6	Mercury	0.03		cv
	7440-02-0	Nickel			NR
	7440-09-7	Potassium			NR
•	7782-49-2	Selenium_		_	NR
	7440-22-4	Silver			NR
	7440-23-5	Sodium			NR
	7440-28-0 7440-62-2	Thallium_ Vanadium		-	NR NR
	7440-62-2	Zinc		-	NR NR
	7440 00 0	Cyanide			NR
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					

1 INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
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A Names BOUR	nec.		Contract: 93	ı na	19	K40274F
علم Name: AQUAT						CDC No.
Lab Code: AQUAI	Ca	se No.: BI	SAS No.	: _		SDG No.: 40139
Matrix (soil/wa	ter): FISH	_	·	La	b Samp]	le ID: 215582
Level (low/med)	: LOW_			Da	te Rece	eived: 10/13/93
Solids:	100.	0				
Con	ncentration	Units (ug	/L or mg/kg dry	7 W	reight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		NR
	7440-36-0	Antimony		-		NR NR
	7440-38-2	Arsenic		-		NR
	7440-39-3	Barium		-		NR
	7440-41-7			-		NR
	7440-43-9	Cadmium		-		NR
	7440-70-2	Calcium		-		NR
1	7440-47-3	Chromium		-		NR
	7440-48-4			-		NR
	7440-50-8			-		NR
	7439-89-6	Iron		-1		NR
	7439-92-1	Lead		-		NR
	7439-95-4	Magnesium	· · · · · · · · · · · · · · · · · · ·	-1		NR
	7439-96-5	Manganese				NR
	7439-97-6	Mercury	0.05	-		CV
1	7440-02-0	Nickel -				NR
	7440-09-7	Potassium		-		NR
	7782-49-2	Selenium		-		NR
	7440-22-4			-		NR
L.	7440-23-5	Sodium		-		NR
1	7440-28-0	Thallium		-		NR
	7440-62-2	Vanadium -		-		NR
· ·	7440-66-6	Zinc		-		NR
		Cyanide_				NR
olor Before:		Clarit	y Before:		•	Texture:
olor After:		Clarit	y After:		_	Artifacts:
omments:						
						· · · · · · · · · · · · · · · · · · ·
						·
						

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1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		INORGANIC '	ANALYSES DATA :	DUTET	
_ab Name: AQUA	ТЕС		Contract: 91	1082	K40275F
Lab Code: AQUA	I_ Ca	se No.: BI	SAS No.		SDG No.: 40139_
Matrix (soil/w	ater): FISH	_		Lab Samp	le ID: 215584
Level (low/med): LOW_			Date Rec	eived: 10/13/93
<pre>\$ Solids:</pre>	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-	NR
	7440-36-0	Antimony_			NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium			NR
	7440-41-7	Beryllium			NR
	7440-43-9	CadmiumCalcium		-	NR NR
	7440-70-2 7440-47-3	Chromium		-	NR NR
	7440-48-4	Cobalt			NR
	7440-50-8	Copper		-	NR
	7439-89-6	Iron			NR
	7439-92-1	Lead			NR
	7439-95-4	Magnesium		-	NR
	7439-96-5	Manganese			NR .
	7439-97-6	Mercury	0.03		CV
	7440-02-0	Nickel			NR
	7440-09-7	Potassium			NR
	7782-49-2	Selenium_		_	NR
	7440-22-4 7440-23-5	Silver Sodium			NR
	7440-23-5	Thallium		-	NR NR
	7440-62-2	Vanadium_			NR
	7440-66-6	Zinc		-	NR
		Cyanide			NR
					1_1
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					
					

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

سے Name: AQUA	TEC		Contract: 93	1082	K40284F		
Lab Code: AQUA	I_ Ca	se No.: BIO	SAS No.:	·	SDG No.: 40139_		
Matrix (soil/w	ater): FISH	-		Lab Sampl	e ID: 215622		
Level (low/med): LOW_	-		Date Rece	eived: 10/13/93		
% Solids:	100.	0					
Concentration Units (ug/L or mg/kg dry weight): MG/KG							
	CAS No.	Analyte	Concentration	C Q	м		
	7429-90-5 7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-47-3 7440-48-4 7440-50-8 7439-92-1 7439-95-4 7439-95-4 7439-97-6 7440-02-0 7440-02-0 7440-22-4 7440-23-5 7440-28-0 7440-66-6	Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury			NR NR NR NR NR NR NR NR NR NR NR NR NR N		
Color Before:		Clarit	y Before:	,	Texture:		
Color After:		Clarit	y After:		Artifacts:		
Comments:		· · · · · · · · · · · · · · · · · · ·					

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQUATEC	C		Contract: 91	L082	K40285F			
Lab Code: AQUAI_	Cas	se No.: BIO	D SAS No.:		SDG No.: 40139_			
Matrix (soil/wate	Matrix (soil/water): FISH_ Lab Sample ID: 215586							
Level (low/med): LOW Date Received: 10/14/93								
% Solids:	100.0)						
Concentration Units (ug/L or mg/kg dry weight): MG/KG								
. CA	AS No.	Analyte	Concentration	C Q	м			
74 74 74 74 74 74 74 74 74 74 74 74 74 7	40-38-2 40-39-3 40-41-7 40-43-9 40-70-2 40-47-3 40-48-4 40-50-8 39-89-6 39-92-1 39-95-4 39-95-4 39-96-5 39-97-6 40-02-0 40-09-7 82-49-2 40-23-5 40-28-0 40-62-2 40-66-6	Aluminum_ Antimony_ Arsenic_ Barium_ Beryllium Cadmium_ Calcium_ Chromium_ Cobalt_ Copper_ Iron_ Lead_ Magnesium Manganese Mercury_ Nickel Potassium Selenium_ Silver_ Sodium_ Thallium_ Vanadium_ Zinc_ Cyanide_	0.06	-	NR NR NR NR NR NR NR NR NR NR NR NR NR N			
Color Before:		Clarit	y Before:		Texture:			
Color After:		Clarit	y After:		Artifacts:			
Comments:								

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INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
		110-

⊸ab Name: AQUA	TEC	•	Contract: 91	L082	K40286F
		so No : PT	O SAS NO	,	SDG No.: 40139
Lab Code: AQUA	.1_ Ca	se no bi	J SAS NO.	· ———	3DG NO 40139
Matrix (soil/w	ater): FISH	-		Lab Samp	ole ID: 215588
Level (low/med): LOW_	-		Date Rec	ceived: 10/14/93
Solids:	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-[- NR
	7440-36-0	Antimony]	-	NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium -			NR
	7440-41-7	Beryllium		-	- NR
	7440-43-9				NR
	7440-70-2	Calcium			NR
	7440-47-3	Chromium		_	NR
	7440-48-4	Cobalt		_	NR
	7440-50-8	Copper		-	NR
	7439-89-6	Iron			NR
	7439-92-1	Lead		· ·	NR
	7439-95-4	Magnesium			NR
	7439-96-5	Manganese			NR
	7439-97-6	Mercury	0.12	-	- cv
	7440-02-0	Nickel			NR
	7440-09-7	Potassium			NR
•	7782-49-2	Selenium_			NR
	7440-22-4				NR
	7440-23-5	Sodium			NR
•	7440-28-0	Thallium			NR
	7440-62-2	Vanadium_			NR
	7440-66-6	Zinc		_	NR
		Cyanide			NR
	I	l		_1_1	_ l l
color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
omments:					

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1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		THOMOTOTE .	anibiodo billi.	J	·
ه Name: AQU	ATEC		Contract: 9:	1082	K40315F
		an No a DT			SDC No + 40120
Lab Code: AQUA	AI_ Ca	se No.: DI	SAS NO.	•	SDG No.: 40139_
Matrix (soil/	water): FISH	_		Lab Sam	ple ID: 215590
Level (low/med	i): LOW_	_		Date Re	ceived: 10/14/93
% Solids:	100.	0			
Co	oncentration	Units (ug	/L or mg/kg dry	y weight): MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5			-	NR
	7440-36-0	Antimony_		_	NR
	7440-38-2 7440-39-3	Arsenic Barium		_	NR NR
	7440-39-3	Beryllium		-	- NR
	7440-43-9	Cadmium		-	- NR
	7440-70-2	Calcium		-	- NR
	7440-47-3	Chromium		-	NR
	7440-48-4	Cobalt			NR
	7440-50-8	Copper			_ NR
	7439-89-6	Iron			NR
	7439-92-1	Lead		[<u>-</u> -	NR
	7439-95-4 7439-96-5	Magnesium		-	NR NR
	7439-98-5	Manganese Mercury	0.08	-	- CV
	7440-02-0	Nickel -		-	- NR
	7440-09-7	Potassium		- 	NR
	7782-49-2	Selenium	· · · · · · · · · · · · · · · · · · ·	-	NR
	7440-22-4	Silver -		-	NR NR
	7440-23-5	Sodium			_ NR
	7440-28-0	Thallium_			NR
	7440-62-2	Vanadium_		_	NR
	7440-66-6	Zinc		-	NR NR
		Cyanide		-	_ NR
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	ty After:		Artifacts:
Comments:					

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		NALYSES DATA SHEET			EPA SAMPLE NO.		
→ Name: AOUA	TEC		Contract: 91	1082	2	K40316F	
Lab Code: AQUAI_ Case No.: BIO_ SAS No.:						CDC No	'
Lab Code: AQUA	I_ Ca	se No:: RIG	SAS NO.	· _		SDG NO.: 40	139_
Matrix (soil/wa	ater): FISH	_		Lab	Samp]	le ID: 215592	
Level (low/med): LOW_	_		Dat	te Rece	eived: 10/14/	93
% Solids:	100.	o					
Con	ncentration	Units (ug	/L or mg/kg dry	y We	eight):	MG/KG	
	CAS No.	Analyte	Concentration	С	Q	м	
	7429-90-5	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver				NR NR NR NR NR NR NR NR NR NR NR NR NR N	
Color Before:		Clarit	y Before:	<u>. </u>		Texture:	
Color After:		Clarit	y After:			Artifacts: _	
Comments:							

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INORGANIC ANALYSES DATA SHEET

Name AOII	AMEC	4	Contract: 91	1082		K40317F
						SDG No.: 40139
			OND NOT			
atrix (sòil/	water): FISH			Lab	Sampl	e ID: 215594
evel (low/med	d): LOW_	-		Dat	e Rece	ived: 10/14/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y we	ight):	MG/KG
	1	T				—,
	CAS No.	Analyte	Concentration	c	Q	M
	7429-90-5	Aluminum		- -		NR
		Antimony		- -		NR
	7440-38-2	Arsenic		- -		NR
	7440-39-3	Barium		- -		NR
	7440-41-7	Beryllium				NR
	7440-43-9	Cadmium_				NR
	7440-70-2	Calcium_				NR
	7440-47-3	Chromium_		_ _		NR
	7440-48-4	Cobalt		_ _		NR
	7440-50-8	Copper		_ _		NR
	7439-89-6	Iron		_ _		NR
	7439-92-1	Lead		-		NR
_	7439-95-4	Magnesium		- -		NR .
	7439-96-5	Manganese	0.09	- -		NR
	7439-97-6	Mercury	0.09	- -		CV NR
		Nickel Potassium		- -		NR NR
	■ *	Selenium		- -		NR
		Silver		- -		NR
		Sodium		- -		NR
		Thallium		- -		NR
		Vanadium		- -		NR
	7440-66-6	Zinc	·	- -		NR
		Cyanide		- -		NR
lor Before:		Clarit	cy Before:	<u> </u>		Texture:
lor After:		Clarit	ty After:			Artifacts:
mments:						
						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQUATEC			Contract: 91082			K40322F	
Lab Code: AQUA						SDG No.: 40139	
Lab Code: Agua.		SC NOTE DI					
Matrix (soil/wa	ater): FISH	_		La	b Sample	e ID: 215604	
Level (low/med)): LOW_	_		Da	te Rece	ived: 10/14/93	
% Solids:	100.	0					
Cor	ncentration	Units (ug	/L or mg/kg dry	, w	eight):	MG/KG	
	CAS No.	Analyte	Concentration	С	Q 1	м	
	7429-90-5	Aluminum		-	——— []	NR	
		Antimony -		-		NR	
	7440-38-2	Arsenic				NR	
ļ	7440-39-3	Barium				NR	
	7440-41-7	Beryllium		_		NR	
	7440-43-9	Cadmium_		_		NR NR	
	7440-70-2 7440-47-3	Calcium Chromium		_		NR NR	
		Cobalt		-		NR	
	7440-50-8	Copper		-		NR	
	7439-89-6	Iron		-		NR	
	7439-92-1	Lead		-		NR	
	7439-95-4	Magnesium		-1		NR .	
_	7439-96-5	Manganese				NR -	
	7439-97-6	Mercury	0.07			CV	
	7440-02-0	Nickel				NR	
		Potassium		_		NR	
•		Selenium_		_		NR	
		Silver		_		NR ·	
		Sodium	. —————	_		NR NR	
		Thallium_ Vanadium		-		NR NR	
	7440-62-2	Zinc				NR NR	
	7440 00 0	Cyanide				NR	
Color Before:		Clarit	cy Before:			Texture:	
Color After:		Clarit	ty After:			Artifacts:	
Comments:							

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQUA	TEC		Contract: 9	1082	K40325F
_					SDG No.: 40139_
Matrix (soil/w	ater): FISH	_	·	Lab Sampl	e ID: 215606
Level (low/med): LOW_	.		Date Rece	eived: 10/15/93
% Solidș:	100.	0			
Co	ncentration	Units (ug/	L or mg/kg dry	y weight):	MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7440-41-7 7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-92-1 7439-95-4 7439-96-5	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc	0.12		NR NR NR NR NR NR NR NR NR NR NR NR NR N
		Cyanide			NR
Color Before:			y Before:	•	Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					

FORM I - IN

MISCELLANEOUS PARAMETERS

PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.

40139

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 215576R1

 Date Received:
 10/13/93

 Date Extracted:
 04/07/94

 Date Analyzed:
 05/24/94

 Sulfur Clean-up:
 N

SDG:

	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
	2052-07-5	2-Bromobiphenyl	0.010	UJ	
	2113-57-7	3-Bromobiphenyl	0.010	UJ	
	92-66-0	4-Bromobiphenyl	0.010	リナ	
	118-74-1	Hexachlorobenzene	0.0050	UJ	
	58-89-9	gamma-BHC	0.0050	d d	
	309-00-2	Aldrin	0.045	ナ	
	1024-57-3	Heptachlor Epoxide	0.023	7	
	5103-74-2	gamma-Chlordane	0.013		·R
	5103-71-9	alpha-Chlordane	0.0064	3	
	39765-80-5	trans-Nonachlor	0.0076		R
	72-55-9	4,4'-DDE	0.059	丁	
Г	60-57-1	Dieldrin	0.010	UÚ	
	72-54-8	4,4'-DDD	0.027	J	
	5103-73-1	cis-Nonachlor	0.0069	NC	
	50-28-3	4,4' DDT	0.010		R
	36355-01-8	Hexabromobiphenyl	0.020	U.J	
	8001-35-2	Toxaphene	0.20	U	

MISCELLANEOUS PARAMETERS

	_		Fillet	% Lipids		
Sample ID	Description	Sex	Weight	Fillet	Body	
K40268	Carp	female	748g	0.80	0.70	
K40269	Carp	female	839g	1.06	0.96	
K40270	Carp	female	635g	3.88	4.30	
K40271	Carp	female	586g	1.78	4.90	
K40272	Carp	female	463g	0.90	1.30	
K40273	Carp	female	438g	0.94	3.60	
K40274	Сагр	female	364g	2.76	7.60	
K40275	Carp	female	547g	2.51	6.60	
K40284	Carp	male	405g	2.16	10.4	
K40285	Carp	female	680g	2.01	2.62	
K40286	Carp	female	606g	6.84	12.3	
K40315	Carp	female	549g	0.97	2.53	
K40316	Carp	female	710g	0.66	1.29	
K40317	Carp	female	837g	0.51	1.18	
K40322	Carp	female	281g	1.32	4.21	
K40325	Carp	female	715g	0.60	0.92	

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 40191

PCB, PESTICIDE AND MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc. Colchester, Vermont

Review performed by:

Blasland, Bouck & Lee, Inc. Syracuse, New York

<u>Summary</u>

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40191 for the biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and qualified sample results. Analyses were performed on the following samples:

					Analy	ele.	
Sample ID	Lab ID	Species	Description	Sample Location	Pest/PCB/ Hg	#Upid	
K40303F	208761	bass	fillet	Trowbridge Dam	x	×	
K40303R	208762	bass	carcass	Trowbridge Dam		x	
K40307F	208763	bass	fillet	Trowbridge Dam	x	x	
K40307R	208764	bass	carcass	Trowbridge Dam		×	
K40323F	208766	bass	fillet	Trowbridge Dam	х	×	
K40323R	208767	bass	carcass	Trowbridge Dam		x	
K40324F	208768	bass	fillet	Trowbridge Dam	x	×	
K40324R	208769	bass	carcass	Trowbridge Dam		×	
K40371F	208770	bass	fillet	Plainwell Dam	x	×	
K40371R	208771	bass	carcass	Plainwell Dam		×	
K40372F	208772	bass	fillet	Plainwell Dam	х	×	
K40372R	208773	bass	carcass	Plainwell Dam		×	
K40373F	208774	bass	fillet	Plainwell Dam	x	x	
K40373R	208775	bass	carcass	Plainwell Dam		x	
K40374F	208776	bass	fillet	Plainwell Dam	x	×	
K40374R	208777	bass	carcass	Plainwell Dam		x	

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40372F, K40373 and K40374F. No qualifiers were added to these samples based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

No matrix spike or matrix spike duplicate was included with this data set.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u> </u>		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	<u> x</u>	****	
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		_ x	
Holding Times			
Have any holding times been exceeded?		<u>. X</u>	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	x		
If yes, were the samples reanalyzed?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?			×
How many spike recoveries were outside of QC limits?			·
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
0_ out of0	;		
Blanks			
Is a Method Blank Summary Form present?	<u>X</u>		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	X		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		x	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	X	-	
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	. x		
Are %D values for all compounds within limits (less than 15%)?	x		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	X		

PCB Data Review Checklist - Page 3

	YES	NO	· NA
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	X		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
ls both a combined and single column Aroclor Identification Report present for every sample?	X		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Lin	nits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x	<u> </u>	
Chromatogram Quality			
Were the baselines stable?	<u> </u>		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		x	
Field Duplicates			
Where field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding	Surrogates	- Column 1	Surrogates - Column:2		
	Time	TCX	DCB	TCX	DCB -	
K40303F	OK for all		ок		ок	
K40307F	samples					
K40323F						
K40324F						
K40371F						
K40372F		↓ (58)		Į (59)		
K40373F		↓ (59)		↓ (59)		
K40374F		↓ (59)		ļ (59)		

Surrogate Standards
TCX Tetrachioro-m-xylene
DCB Decachlorobiphenyl

Qualifiers:

- D Surrogates diluted out
 - Recovery high
 - Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2618</u> Column: <u>RTX-35 / RTX-5</u>

Date:	4/30/94 0543	5/4	5/4	5/5	5/5	5/5	6/5
Fime:	to 5/1/94 0106	1925	1959	0250	0324	1014	1048
•	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Gal.	Cont. Cal.
	%RSD	% D	%0	% D	% D	% D	%D
Aroclor 1016	4.2 / 4.4				į į		
Aroclor 1221	5.1 / 6.9						
Aroclor 1232	4.2 / 3.1						
Aroclor 1242	3.1 / 3.4		3.5				
Aroclor 1248	3.4 / 3.0	4.5		2.0		1.0	
Aroclor 1254	3.1 / 3.6				5.0		
Aroclor 1260	3.8 / 3.4						1.0
etrachioro-m-xylene	5.2 / 6.4						
Decachlorobiphenyl	7.9 / 8.1						
ffected Samples:							
		_					
				-			
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				øs.			

PCB Calibration Summary - Page 2

Instrument: <u>HP2618</u> Column: <u>RTX-35 / RTX-5</u>

Date:		5/6	5/6	5/7	5/7		
Time:		1401	1435	0044	0119		
	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Gal.
•	%RSD	XD	SD.	SAD	XD	%D	%D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232							
Aroclor 1242							
Aroclor 1248		0.5		3.0			
Aroclor 1254			0.5			! 	
Arocior 1260	i				6.0		
Tetrachloro-m-xylene							
Decachlorobiphenyl		 					
Affected Samples:			<u> </u>				
						· ,	
:							
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			·				

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40303F Lab Name: Aquatec, Inc. Lab Code: IAUDA 91082 Case: BIO Contract: SDG: 40191 **BIOTA** Phase Type: Lab Sample ID: 208761 Phase Weight: 10.0 **Date Received: (g)** 10/14/93 1.0 (uL) Injection Volume: Date Extracted: 03/29/94 5.0 Dilution Factor: Date Analyzed: 05/05/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u>a</u>
12674-11-2	Arocior-1016	0.71	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.6	
11096-82-5	Arocior-1260	0.20	J

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40307F Lab Code: AQUAI Aquatec, Inc. Lab Name: 91082 BIO SDG: 40191 Case: Contract: **BIOTA** Lab Sample ID: 208763 Phase Type: Phase Weight: 10.0 **Date Received:** 10/14/93 **(g)** 1.0 (uL) Date Extracted: Injection Volume: 03/29/94 Dilution Factor: 05/05/94 5.0 Date Analyzed: Sulfur Clean-up: (Y/N) Ν

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.38	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Arocior-1254	1.0	
11096-82-5	Aroclor-1260	0.13	J

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40323F Lab Name: Aquatec, Inc. Lab Code: **IAUDA** 91082 Case: Contract: BIO SDG: 40191 Phase Type: **BIOTA** Lab Sample ID: 208766 10.0 Phase Weight: (g) Date Received: 10/15/93 Injection Volume: 1.0 (uL) Date Extracted: 03/29/94 Dilution Factor: 1.0 Date Analyzed: 05/05/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Arocior-1016	0.22	
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.52	
11096-82-5	Aroclor-1260	0.050	U

EPA SAMPLE NO. K40324F Lab Code: **AQUAI** Lab Name: Aquatec, Inc. 91082 Case: BIO 40191 Contract: SDG: _ Phase Type: **BIOTA** Lab Sample ID: 208768 Phase Weight: 10.0 Date Received: 10/15/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 03/29/94 Dilution Factor: 2.0 Date Analyzed: 05/05/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.31	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.76	
11096-82-5	Aroclor-1260	0.089	J

EPA SAMPLE NO. K40371F Lab Code: Lab Name: Aquatec, inc. **AQUAI** Contract: 91082 BIQ SDG: Case: 40191 Phase Type: **BIOTA** Lab Sample ID: 208770 Phase Weight: 10.0 (g) Date Received: 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 03/30/94 Dilution Factor: 2.0 Date Analyzed: 05/06/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	٥
12674-11-2	Aroclor-1016	0.48	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Arocior-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Aroclor-1260	0.10	υ

EPA SAMPLE NO.

K40372F , Lab Name: Aquatec, Inc. Lab Code: **AQUAI** SDG: 40191 Contract: 91082 BIO Case: Phase Type: **BIOTA** Lab Sample ID: 208772 Phase Weight: 10.0 **(g)** Date Received: 10/16/93 1.0 Injection Volume: (uL) 03/30/94 Date Extracted:

Dilution Factor:

5.0

Sulfur Clean-up: N_ (Y/N)

Date Analyzed:

05/05/94

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	υ
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Aroclor-1254	0.41	
11096-82-5	Aroclor-1260	0.13	J

EPA SAMPLE NO. K40373F Lab Name: Aquatec, inc. Lab Code: **AQUAI** Contract: 91082 Case: BIO SDG: 40191 **BIOTA** Phase Type: Lab Sample ID: 208774 Phase Weight: 10.0 Date Received: (g) 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 03/30/94 5.0 Dilution Factor: Date Analyzed: 05/05/94 Sulfur Clean-up: Ν (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)		
12674-11-2	Aroclor-1016	0.25	U	
11104-28-2	Aroclor-1221	0.25	U	
11141-16-5	Aroclor-1232	0.25	U	
53469-21-9	Aroclor-1242	0.25	U	
12672-29-6	Aroclor-1248	1.6		
11097-69-1	Aroclor-1254	0.60		
11096-82-5	Aroclor-1260	0.25	U	

EPA SAMPLE NO. K40374F Aquatec, Inc. Lab Code: IAUDA Lab Name: _ 91082 Case: BIO SDG: 40191 Contract: **BIOTA** 208776 Phase Type: Lab Sample ID: 10.0 Phase Weight: (g) **Date Received:** 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 03/30/94 5.0 Dilution Factor: Date Analyzed: 05/05/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)		
12674-11-2	Aroclor-1016	0.25	U	
11104-28-2	Aroclor-1221	0.25	U	
11141-16-5	Aroclor-1232	0.25	U	
53469-21-9	Aroclor-1242	0.25	U	
12672-29-6	Aroclor-1248	0.25	U	
11097-69-1	Aroclor-1254	1.3		
11096-82-5	Aroclor-1260	0.14	J	

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits. •

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40303F	Aldrin 4,4'-DDE 4,4'-DDT	42.1% 27.4% 421.7%
K40307F	Aldrin 4,4'-DDE 4,4'-DDT	40.7% 26.7% 464.7%
K40323F	Aldrin 4,4'-DDE	41.9% 40.0%
K40324F	Aldrin 4,4'-DDE	42.9% 33.3%
K40371F	Aldrin 4,4'-DDE	90.0% 64.3%
K40372F	Aldrin 4,4'-DDE	75.9% 58.6%
K40373F	Aldrin 4,4'-DDE 4,4'-DDT	87.5% 67.7% 400.0%
K40374F	Aldrin 4,4'-DDE	81.3% 35.6%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

No matrix spike or matrix spike duplicate was included in this data set.

8. System Performance and Overall Assessment

'Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u> </u>		
Are the samples numbers included in the narrative?	<u> </u>		
Are the sample chain-of-custodies present?	X		-
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are the surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Are the outliers correctly marked with an asterisk?			X
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			X
Were the method blanks reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?		X	
Were matrix spikes analyzed at the required frequency?			X
How many spike recoveries were outside of QC limits?			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
Is the method blank summary form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA_
Is the chromatographic performance acceptable for each instrument?	<u> </u>		-
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		<u> </u>	
Calibration and GC Performance		•	
Are the following chromatograms and data printouts presblanks, and MS/MSD?	sent for a	all samples	,
peak resolution check	<u> x</u>		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	×		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	<u> </u>		·
is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		x	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	X		
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?	X		
Analytical Sequence Check			
Is Form VIII present and complete for each column and each period of analyses?	×		·
	- 		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
Is Form IX-1 present for each lot of Florisil cartridges used?	X		
Are all samples listed on the form?	X		
If GPC cleanup was performed, is Form IX-2 present?		-	X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	X		
GPC calibration (80-110%)			X
Pesticide/PBB Identification			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u> </u>		
Was GC/MS confirmation provided when required?			x
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?		X	
Were there any false negatives?		X	
Compound Quantitation and Reported Detection Limit	8		 -
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	<u> </u>		
Chromatogram Quality			
Were the baselines stable?	<u> </u>		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Where field duplicates submitted with the samples?		X	

Pesticide/PBB Qualifier Summary Holding Time and Surrogates

Sample ID	Holding	Surrogates	- Column 1	Surrogates - Golumn 2		
	Time	TCX	DCB	тсх	DCB	
K40303F	OK for all	ок	ок	ок	ок	
K40307F	samples					
K40323F						
K40324F			·	•		
K40371F						
K40372F						
K40373F			·	_		
K40374F						
		··				
				T		

Surrogates:

TCX Tetrachloro-m-xylene

DCB Decachlorobiphenyl

Qualifiers:

D Surrogate diluted out

Recovery high

↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: <u>HP2404</u> Column: <u>RTX-5</u>

Date:	-4/20/94	4/21	4/21				
Time:	16:59	07:16	10:50				
1	initial Cal	Cont. Cal.	Cont. Cal.	Cont. Cal.	Gont. Cal.	Cont. Cal.	Cont. Cal.
	% ASD	%D	% D	%D	% D	% D	%D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl					<u> </u>		
4-Bromobiphenyl							
Hexachlorobenzene	<u> </u>						
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide				:			
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene					0.		
Decachlorobiphenyl							
Affected Samples:							
ſ							
Ī		-					
							

Pesticide/PBB Calibration Summary - Page 2

Instrument: <u>HP2404</u> Çolumn: <u>RTX-35</u>

Date:	4/20/94	4/21	4/21				
Time:	18:59	07:16	10:50				
v	initial Cal.	Cent. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal
	%RSD	% D	%D	% D	% 0	X D	% D
2-Bromobiphenyl	. ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane						<u></u>	
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT				·		<u> </u>	<u> </u>
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachloro-m-xylene							<u> </u>
Decachlorobiphenyl							
Affected Samples:						<u> </u>	
ſ							
Ī							
<u> </u>				-			

Corrected Sample Analysis Data Sheets

 Lab Name:
 Aquatec, Inc.
 K40303F

 Lab Code:
 AQUAI
 K40303F

 Contract:
 91082
 SDG:
 40191

 Case:
 BIO
 SDG:
 40191

 Phase Type:
 Biota
 Date Received:
 10/14/93

Client ID No.

Phase Type: **Biota Date Received:** 10/14/93 Phase Weight: 03/29/94 10.0 Date Extracted: 04/21/94 Extraction: Soxhlet Date Analyzed: 1.0 N Dilution Factor: Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachiorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.038	J	
1024-57-3	Heptachlor Epoxide	0.033		
5103-74-2	gamma-Chlordane	0.0050	U	
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.062		
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.016		
5103-73-1	cis-Nonachlor	0.0050	U	
50-29-3	4,4'-DDT	0.023		R
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

Client ID No. K40307F Aquatec, Inc. Lab Name: Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40191 Lab Sample ID: 208763 Phase Type: **Biota Date Received:** 10/14/93 Phase Weight: 10.0 **Date Extracted:** 03/29/94 04/21/94 Soxhlet Extraction: Date Analyzed: 1.0 Sulfur Clean-up: Dilution Factor: N

				_
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyi	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	1
92-66-0	4-Bromobiphenyl	0.010	U	1
118-74-1	Hexachlorobenzene	0.0050	U	1
58-89-9	gamma-BHC	0.0050	U	1
309-00-2	Aldrin	0.027	T	1
1024-57-3	Heptachlor Epoxide	0.022		1
5103-74-2	gamma-Chiordane	0.0050	U	1
5103-71-9	alpha-Chlordane	0.0050	U	1
39765-80-5	trans-Nonachlor	0.0050	U	1
72-55-9	4,4'-DDE	0.045	7	1
60-57-1	Dieldrin	0.010	U	1
72-54-8	4,4'-DDD	0.010	U	1
5103-73-1	cis-Nonachlor	0.0050	U	1
- 50 29 3	4,4'-DDT	0.017		R
36355-01-8	Hexabromobiphenyl	0.020	U	1'`
8001-35-2	Toxaphene	0.20	U	1

 Lab Name:
 Aquatec, Inc.

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

K40323F

40191

Client ID No.

Phase Type: Biota

 Lab Sample ID:
 208766

 Date Received:
 10/15/93

 Date Extracted:
 03/29/94

Phase Weight: 10.0 g
Extraction: Soxhlet

Dilution Factor: 1.0

Date Analyzed: 04/21/94
Sulfur Clean-up: N

SDG:

COMPOUND	CONCENTRATION (mg/Kg)	a
2-Bromobiphenyl	0.010	U
3-Bromobiphenyl	0.010	Ū
4-Bromobiphenyl	0.010	U
Hexachlorobenzene	0.0050	U
gamma-BHC	0.0050	Ū
Aldrin	0.017	J
Heptachlor Epoxide	0.019	
gamma-Chlordane	0.0050	U
alpha-Chlordane	0.0050	U
trans-Nonachior	0.0050	U
4,4'-DDE	0.020	5
Dieldrin	0.010	U
4,4'-DDD	0.010	U
cis-Nonachlor	0.0050	Ü
4,4'-DDT	0.010	Ü
Hexabromobiphenyl	0.020	U
Toxaphene	0.20	U
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gamma-Chlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	Comp/Kg Comp/Kg

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40324F

40191

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 208768

Date Received: 10/15/93

Date Extracted: 03/29/94

Date Analyzed: 04/21/94

Sulfur Clean-up: N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.021	7
1024-57-3	Heptachlor Epoxide	0.019	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.033	4
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

 Lab Name:
 Aquatec, Inc.
 K40371F

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40191

 Lab Sample ID:
 208770

 Phase Type:
 Biota
 Date Received:
 10/16/93

Client ID No.

		Lao Sample II	D: 200770
Phase Type:	Biota	Date Receive	d: 10/16/93
Phase Weight:	10.0 g	Date Extracte	d: 03/30/94
Extraction:	Soxhlet	Date Analyze	d: 04/21/94
Dilution Factor:	1.0	Sulfur Clean-u	p: N
		 	

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	υ	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.0020		ŀR
1024-57-3	Heptachlor Epoxide	0.023		
5103-74-2	gamma-Chlordane	0.0050	U	
5103-71-9	alpha-Chlordane	0.0050	U	İ
39765-80-5	trans-Nonachlor	0.0050	U	l
72-55-9	4,4'-DDE	0.028	IN	ĺ
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.010	U	
5103-73-1	cis-Nonachlor	0.0050	U	
50-29-3	4,4'-DDT	0.010	U	1
36355-01-8	Hexabromobiphenyl	0.020	U	ĺ
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40372F

40191

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 208772

Date Received: 10/16/93

Date Extracted: 03/30/94

Date Analyzed: 04/21/94

Sulfur Clean-up: N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachiorobenzene	0.0050	V
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.029	JN
1024-57-3	Heptachlor Epoxide	0.035	
5103-74-2	gamma-Chlordane	0.0050	Ü
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	Ū
72-55-9	4,4'-DDE	0.029	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	υ
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.
K40373F

40191

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 208774

Date Received: 10/16/93

Date Extracted: 03/30/94

Date Analyzed: 04/21/94

Sulfur Clean-up: N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.032	JN
1024-57-3	Heptachlor Epoxide	0.039	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.031	JN
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.018	/
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 208776

Date Received: 10/16/93

Date Extracted: 03/30/94

Date Analyzed: 04/21/94

Sulfur Clean-up: N

Client ID No.

K40374F

40191

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	υ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.016	JN
1024-57-3	Heptachlor Epoxide	0.013	
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.045	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced in to the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was below acceptable limits. All data have been qualified as estimated based on the deviation.

1 -

4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was outside acceptable limits. No qualifiers have been added to the samples based on the RPDs.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	Χ		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	<u> </u>		
SDG No.?	X		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
ls the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	×		
is the data properly labeled?	X		
Holding Times			
Were mercury analyses performed within 28 days?	X		·
·	-,		

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA_
Were cyanide distillations performed within 14 days?			X
Were other metal analysis performed within 6 months?			X
Form I (Final Data)			
Are all forms complete?	X		
Are correct units indicated on Form I's?	X		
Are all "less than IDL" values properly coded with "U"?	X		
Are the correct concentration qualifiers used with final data?	X		
Was a brief physical description of samples given on Form I's?		X	
Calibration			
Is a record of at least 2 point calibration present for ICP analysis?			X
Is a record of 5 point calibration present for Hg analysis?	X		
Is a record of 4 point calibration present for:			
Flame AA?			X
Furnace AA?			X
Cyanides?			X
ls one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?			Х
ls correlation coefficient less than .995 for:			
Mercury Analysis?	X		
Cyanide Analysis?			X
Atomic Absorption Analysis?			X
Form II A (Initial and Continuing Calibration Verifica	ation)	_ .	
Present and complete for every metal and cyanide?	X		
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?			X
Hg (80-120 %R)?	X		
Cyanides (85-115 %R)?			X

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			X
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)			X
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL <crdl) (crdls)?<="" contract="" detection="" equal="" less="" limits="" or="" required="" td="" than="" the="" to=""><td>X</td><td></td><td></td></crdl)>	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			Х
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

Inorganic Data Validation Checklist - Page 4

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			X
Is concentration of prep. blank below the negative CRDL?		X	
Form IV (ICP Interference Check Sample)			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits (±20%)?			X
If no, is concentration of AI, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
Form V A (Spiked Sample Recovery - Pre-Digestion/P	re-Distil	<u>lation)</u>	
Present and complete for:			
each SDG?	X		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?		X	
If no, is sample concentration greater than or equal to four times spike concentration?		X	
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	X		
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?	X		
between 126-200%?		×	
greater than 200%?		X	
Form VI (Lab Duplicates)			
Present and complete for:			
each SDG?	X		

Inorganic Data Validation Checklist - Page 5

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?		X	
If 'no, are all results outside the control limits flagged with an * on Form I's and VI?	X .		
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		X .	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
Form VII (Laboratory Control Sample)			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
Form IX (ICP Serial Dilution)			
Was Serial Dilution analysis performed for:			
each SDG?			×
each matrix type?			×
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E"" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
≥100%?			X
Furnace Atomic Absorbtion (AA) QC Analysis			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA?			X

Inorganic Data Validation Checklist - Page 6

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?			X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?			X -
ls analytical spike recovery outside the control limits (85-115%) for any sample?			X
Form VIII (Method of Standard Addition Results)			
Present?		X	
If no, is any Form I result coded with "S" or a "+"?		X	
Is coefficient of correlation for MSA less than 0.990 for any sample?			X
Was MSA required for any sample but not performed?		X	
Is coefficient of correlation for MSA less than 0.995?			X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?			X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?			X
Field Blank			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?			X
If no, was field blank value already rejected due to other QC criteria?			Х
Form X, XI, XII (Verification of Instrumental Paramet	ers)		· · · · · · · · · · · · · · · · · · ·
Is verification report present for:			
Instrument Detection Limits (quarterly)?	X		
ICP Interelement Correlation Factors (annually)?		·	X
ICP Linear Ranges (quarterly)?			X
Form X (Instrument Detection Limits)			
Are IDLs present for:			
all the analytes?	X		
all the instruments used?	<u> </u>		

Inorganic Data Validation Checklist - Page 7

YES	NO	NA
	X	
		X
		X
	x	
		X
	YES	

Corrected Sample Analysis Data Sheets

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC		Contract: 9	10	82	K40303F
						SDG No.: 4019
trix (soil/	water): FISH	<u>-</u>	•	L	ab Samp	le ID: 208761
vel (low/me	d): LOW_	_		Da	ate Rec	eived: 10/14/94
Solids:	100.	0			•	
C	oncentration	Units (ug	/L or mg/kg dry	y v	weight):	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
	7429-90-5	Aluminum		-		NR
	7440-36-0	Antimony_		-		NR
•	7440-38-2	Arsenic		_	——	NR
		Barium		-		NR
	7440-41-7	Beryllium		-		NR
	7440-43-9	Cadmium		-		NR
		Calcium		_		NR
	7440-47-3	Chromium		_		NR
	7440-48-4	Cobalt -		-		NR
		Copper				NR
	7439-89-6	Iron				NR
	7439-92-1	Lead				NR
		Magnesium				NR
		Manganese				NR
		Mercury	0.11	_	ZN*_	CV
	7440-02-0	Nickel				NR
	7440-09-7	Potassium		_		NR
	7782-49-2	Selenium_				NR
	7440-22-4	Silver				NR
		Sodium		_		NR
	7440-28-0	Thallium_		_		NR
	7440-62-2	Vanadium_		_		NR
	7440-66-6	Zinc		_		NR
		Cyanide		_		NR
lor Before:		Clarit	y Before:	_		Texture:
lor After:		Clarit	y After:	>	_	Artifacts:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

					1
o Name: A(QUATEC		Contract: 9:	1082	K40307F
ab Code: A(QUAI_	Case No.: BI	O SAS No.	:	SDG No.: 40191
atrix (soil	L/water): F	'ISH_		Lab Samp	ole ID: 208763
evel (low/m	med): L	.owwo	•	Date Rec	eived: 10/14/94
Solids:	1	.00.0			
	Consontrat	ion Unita (ua	IT as marles due	· ··oiabtl	· MC/VC
	Concentrat	ion units (ug	/L or mg/kg dry	weight)	: MG/KG
	CAS No.	Analyte	Concentration	C Q	M
	7429-90	-5 Aluminum			NR
	7440-36	-0 Antimony_			NR
	7440-38				NR
	7440-39				NR
-	7440-41			_	NR
	7440-43				NR
	7440-70				NR
	7440-47				NR
	7440-48				NR NR
	7439-89	- I F F	·		NR
	7439-92			-	NR
	7439-95			-	NR
	7439-96-			-	NR
	7439-97-		0.07	_ ZN*_	cv
	7440-02-				NR
	7440-09-			-1	NR
	7782-49-			-	NR
	7440-22-				NR
	7440-23-	-5 Sodium		_	NR
	7440-28-	-0 Thallium			NR
	7440-62-	-2 Vanadium -			NR
	7440-66-				NR
		Cyanide		_	NR
lor Before	:	Clari	ty Before:	\	Texture:
lor After:	_ 	Clari	ty After:		Artifacts:
mments:					

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ر Name: AQUA	TEC		Contract: 91082			K40323F		
ab Code: AQUA	AI_ Case No.: BIO_ SAS No.:				SDG No.: 40191			
atrix (soil/w	ater): FISH			L	ab Sampl	e ID: 208766		
evel (low/med): LOW_	_		Da	ate Rece	ived: 10/15/94		
Solids:	100.	0						
Co	ncentration	Units (ug	/L or mg/kg dry	Ž	weight):	MG/KG		
	CAS No.	Analyte	Concentration	С	Q	м		
	7400 00 6	3 Tana 2 mana		_		G#K		
	7429-90-5 7440-36-0	Aluminum_ Antimony_		 		NR NR		
	7440-38-2	Arsenic	<u> </u>	-		NR NR		
	7440-38-2	Barium		_		NR		
	7440-41-7	Beryllium		_		NR		
	7440-43-9	Cadmium		_		NR		
	7440-70-2	Calcium		_		NR		
	7440-47-3	Chromium		-		NR		
		Cobalt		_		NR		
	7440-50-8	Copper		-		NR		
		Iron		_		NR		
	7439-92-1	Lead		1		NR		
	7439-95-4	Magnesium		•		NR		
		Manganese				NR		
		Mercury	0.36	_		CV		
		Nickel				NR		
		Potassium				NR		
•		Selenium_				NR		
		Silver		_		NR		
		Sodium				NR		
	· -	Thallium_		_		NR		
	7440-62-2	Vanadium_				NR		
	7440-66-6	Zinc		_		NR		
		Cyanide		-		NR		
lor Before:		Clarit	y Before:	_		 Texture:		
lor After:			cy After:			Artifacts:		
mments:			-					

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC		Contract: 9	108	2	K40324F
						SDG No.: 40191_
Matrix (soil/	water): FISH	-		La	b Sampl	e ID: 208768
Level (low/med	i): LOW_	_		Da	te Rece	ived: 10/15/94
% Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
•	7429-90-5	Aluminum	 :	- -		NR
	7440-36-0			- -		NR
	7440-38-2	Arsenic		- -		NR
•	7440-39-3	Barium				NR
	7440-41-7	Beryllium				NR
	7440-43-9					NR
	7440-70-2			I_I.		NR
	7440-47-3	Chromium_		_ .		NR
	7440-48-4	Cobalt		_ .		NR
	7440-50-8	Copper		_ ₋		NR
	7439-89-6	Iron		_ _		NR
	7439-92-1	Lead		_ -		NR
	7439-95-4	Magnesium		I		NR
	7439-96-5	Manganese		_ _		NR
	7439-97-6	Mercury_	0.09	-		CV
	7440-02-0	Nickel		_ -		NR
	7440-09-7	Potassium		- -		NR
*	7782-49-2	Selenium_		_ -		NR
	7440-22-4	Silver		_ -		NR
	7440-23-5	Sodium		_ -		NR
	7440-28-0	Thallium	~	- -		NR
	7440-62-2	Vanadium_		- -		NR
	7440-66-6	Zinc		- -		NR NR
		Cyanide		- -		nk
	I	 !	·	·		—'
Color Before:		Clarit	y Before:			Texture:
Color After:		Clarit	y After:			Artifacts:
Comments:						
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

⊾o Name: AQUA	TEC		Contract: 9	1082	K40371F
Lab Code: AQUA	I_ Ca	se No.: BI	SAS No.	•	SDG No.: 40191_
Matrix (soil/w	ater): FISH			Lab Samp	le ID: 208770
Level (low/med): LOW_			Date Rec	eived: 10/16/93
% Solids:	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG
	CAS No.	Analyte	Concentration	c Q	м
	7440-36-0 7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8	Aluminum_Antimony_Arsenic_Barium_Beryllium_Cadmium_Calcium_Chromium_Cobalt_Copper_Iron_Chrom_Cobalt_Copper_Iron_Chrom_Cobalt_Copper_Iron_Chrom_Cobalt_Copper_Iron_Chrom_Cobalt_Copper_Iron_Chrom_Cobalt_Copper_Iron_Chrom_Cobalt_Copper_Iron_Chrom_Chr			NR NR NR NR NR NR NR NR NR NR NR NR
	7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-22-4 7440-23-5 7440-28-0	Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide	0.16		NR NR CV NR NR NR NR NR NR NR NR NR NR NR NR NR
ا :Color Before		Clarit	y Before:	l l	Texture:
Color After:			y After:		Artifacts:
Comments:					

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ಎ Name: AQU	ATEC		Contract: 9	108	2	K40372F
						SDG No.: 40191
trix (soil/	water): FISH	<u>. </u>		La	b Samp	ole ID: 208772
vel (low/me	d): LOW_			Da	te Rec	eived: 10/16/93
Solids:	100.	0				
C	oncentration	Units (ug	/L or mg/kg dry	y w	eight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	B400 00 E			1_1		755
	7429-90-5	Aluminum_		 _ 	<u></u>	NR
	7440-36-0	Antimony_		-		NR
	7440-38-2 7440-39-3	ArsenicBarium		-		NR NR
	7440-39-3			-		NR
	7440-41-7	Cadmium		1-1		NR
	7440-70-2	Calcium		-		NR
	7440-47-3	Chromium		-		NR
	7440-48-4			-		NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron		-		NR
	7439-92-1	Lead		-		NR
	7439-95-4	Magnesium				NR
	7439-96-5	Manganese		-		NR
	7439-97-6	Mercury	0.07	-	<u>₹N*</u>	CV
		Nickel -		-	7	NR
	7440-09-7	Potassium				NR
•	7782-49-2	Selenium	 .	-		NR
	7440-22-4			-		NR
	7440-23-5			1-1		NR
	7440-28-0			- ·		NR
	7440-62-2	Vanadium		-		NR
	7440-66-6	Zinc		-		NR
		Cyanide		-		NR
or Before:		Clarit	y Before:			Texture:
or After:		Clarit	y After:			Artifacts:
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FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ر Name: AQUA	TEC		Contract: 9	1082			K40373F	
			O SAS No.			SDG	No.: 4019	
trix (soil/w	ater): FISH	i		Lab	Samp.	le ID	: 208774	
vel (low/med	l): LOW_			Date	e Rec	eived	: 10/16/93	
Solids:	100.	0						
			/T am mar/lear alm		i-h+\	. WC/	VC.	
Co		Units (ug	/L or mg/kg dry	y we.	rgirt)	. MG/	NG	
	CAS No.	Analyte	Concentration	С	Q	м		
	7429-90-5	Aluminum				NR		
	7440-36-0	Antimony_				NR		
	7440-38-2	Arsenic_		_ _		NR		
	7440-39-3 7440-41-7	Barium Beryllium		- -		NR NR		
	7440-41-7	Cadmium		- -		NR		
	7440-70-2	Calcium		- -		NR		
		Chromium		- -		NR		
	7440-48-4	Cobalt		- -		NR		
	7440-50-8	Copper		- -		NR		
	7439-89-6	Iron				NR		
	7439-92-1	Lead				NR		
		Magnesium				NR		
		Manganese				NR		
		Mercury	0.15	- -3	_N*	CV		
		Nickel				NR		
		Potassium Selenium				NR NR		
		Silver		- -		NR		
		Sodium		- -		NR		
	7440-28-0	Thallium		- -		NR		
	7440-62-2	Vanadium		- -		NR		
		Zinc		-		NR		
		Cyanide				NR		
	1			_ _		<u> </u>		
lor Before:		Clarit	y Before:			Text	ure:	
lor After:		Clarit	y After:			Arti	facts:	
mments:								

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

K40374F

∽⊿b Name: AQU	ATEC		Contract: 9:	1082	
Lab Code: AQU	AI_ Ca	se No.: BI	O SAS No.	:	SDG No.: 40191_
Matrix (soil/	water): FISH	<u>_</u>		Lab Samp	ple ID: 208776
Level (low/me	d): LOW_			Date Red	ceived: 10/16/93
% Solids:	100.	0			
c	oncentration	Units (ug	/L or mg/kg dry	y weight)): MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum		-	NR
•	7440-36-0	Antimony_		-	NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium			NR
	7440-41-7			l_	NR
	7440-43-9	Cadmium_			NR
	7440-70-2 7440-47-3	Calcium Chromium			NR NR
	7440-47-3				- NR
	7440-50-8	Copper		- 	NR
	7439-89-6	Iron		-	NR
	7439-92-1	Lead		-	NR
		Magnesium			NR
-	7439-96-5	Manganese		-	NR
	7439-97-6	Mercury	0.20	_ Z N*_	CV
	7440-02-0	Nickel			NR
	7440-09-7	Potassium			NR
•	7782-49-2	Selenium_			NR
	7440-22-4	Silver			NR
	7440-23-5	Sodium			NR
	7440-28-0	Thallium_			NR
	7440-62-2	Vanadium_			NR
	7440-66-6	Zinc		-	NR
		Cyanide		-	NR
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					
		<u> </u>			

FORM I - IN

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

			Fillet	% 1	Lipids
Sample ID	Description	Sex	Weight	Fillet	Remaining Carcass
K40303	Small Mouth Bass	female	227g	1.11	4.3
K40307	Small Mouth Bass	male	148g	0.78	2.0
K40323	Small Mouth Bass	female	174g	0.34	0.83
K40324	Small Mouth Bass	male	147g	0.61	2.73
K40371	Small Mouth Bass	female .	219g	1.04	3.5
K40372	Small Mouth Bass	female	194g	1.39	7.4
K40373	Small Mouth Bass	female	265g	1.38	2.9
K40374	Small Mouth Bass	male	230g	0.85	3.2

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 40193

PCB, PESTICIDE AND MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, inc. Colchester, Vermont

Review performed by:

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40219 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and corrected sample results. Analyses were performed on the following samples:

					Analysis	
Sample ID	Leb ID	Species	Description	Sample Location	Pest/PGB/ Hg	XCIpid
K40333W	201581	White Sucker	whole body	Trowbridge Dam	×	x
K40334W	201582	White Sucker	whole body	Trowbridge Dam	x	×
K40335W	201583	White Sucker	whole body	Trowbridge Dam	×	×
K40336W	201584	White Sucker	whole body	Trowbridge Dam	×	х
K40337W	201585	White Sucker	whole body	Trowbridge Dam	×	×
K40338W	201586	White Sucker	whole body	Trowbridge Dam	x	х
K40376W*	201633	White Sucker	whole body	Plainwell Dam	x	×
K40377W	201634	White Sucker	whole body	Plainwell Dam	x	x
K40378W	201635	White Sucker	whole body	Plainwell Dam	x	x
K40379W	201636	White Sucker	whole body	Plainwell Dam	×	х
K40380W	201637	White Sucker	whole body	Plainwell Dam_	x	×

^{*} MS/MSD/DUP performed on sample

PCB ANALYSES

<u>Introduction</u>

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for nonlinearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

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Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	<u> </u>		
Are the samples numbers included in the narrative?	<u> x</u>		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		_x_	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	<u> </u>	·—	
Are all the samples listed on the appropriate surrogate recovery form?	X		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		×	
Matrix Spikes			
Is there a matrix spike recovery form present?	Χ.		
Were matrix spikes analyzed at the required frequency?	x		
How many spike recoveries were outside of QC limits?			
0 out of4			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
_0 out of _2_			
Blanks			
is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

PCB Data Review Checklist - Page 2

	YES	NO	NA_
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	x		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248	X		
Aroclor 1254	X		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?			
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?*	×		
Are %D values for all compounds within limits (less than 15%)?	x		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X		

PCB Data Review Checklist - Page 3

	YES	NO	NA
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	x		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	x		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	X		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			×
Compound Quantitation and Reported Detection Lin	nits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Where field duplicates submitted with the samples?		<u> </u>	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding	Surrogates	- Column 1	Surrogates	- Column 2
	Time	TCX	DCB	TCX	DCB
K40333W	OK for all	ОК	ok	ок	ок
K40334W	eamples				
K40335W					
K40336W					
K40337W					
K40338W					
K40376W					
K40376WMS					
K40376WMSD					
K40377W					
K40378W					
K40379W					
K40380W					

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: <u>HP2618</u> Column: RTX-35 / RTX-5

S/11/94 1334 Cont.	Date:	5/10/94 1845	5/12	5/12	5/12	5/12	5/13	5/13
Aroclor 1016	Time:		0540	0713	1353	1426	0347	0420
Aroclor 1016		Initial Cal.						Cont. Cal.
Aroclor 1221 3.9 / 3.9 Aroclor 1232 3.2 / 3.7 Aroclor 1242 2.7 / 2.8 2.5 Aroclor 1248 3.2 / 2.7 3.0 4.0 1.0 Aroclor 1254 2.8 / 2.8 1.0 Aroclor 1260 3.5 / 2.7 Tetrachloro-m-xylene 4.9 / 3.6 Decachlorobiphenyl 8.6 / 9.2 Affected Samples:		%RSD	% D	% D	% 0	% D	% D	ΧD
Aroclor 1232 3.2 / 3.7 Aroclor 1242 2.7 / 2.8 2.5 Aroclor 1248 3.2 / 2.7 3.0 4.0 1.0 Aroclor 1254 2.8 / 2.8 1.0 Aroclor 1260 3.5 / 2.7 Tetrachloro-m-xylene 4.9 / 3.6 Decachlorobiphenyl 8.6 / 9.2 Affected Samples:	Aroclor 1016	4.6 / 4.6						
Aroclor 1242 2.7 / 2.8 2.5 Aroclor 1248 3.2 / 2.7 3.0 4.0 1.0 Aroclor 1254 2.8 / 2.8 1.0 Aroclor 1260 3.5 / 2.7 Tetrachloro-m-xylene 4.9 / 3.6 Decachlorobiphenyl 8.6 / 9.2 Affected Samples:	Aroclor 1221	3.9 / 3.9						
Aroclor 1248 3.2 / 2.7 3.0 4.0 1.0 Aroclor 1254 2.8 / 2.8 1.0 Aroclor 1260 3.5 / 2.7 Tetrachloro-m-xylene 4.9 / 3.6 Decachlorobiphenyl 8.6 / 9.2 Affected Samples:	Aroclor 1232	3.2 / 3.7		·				
Aroclor 1254	Aroclor 1242	2.7 / 2.8		2.5				
Aroclor 1260 3.5 / 2.7 Tetrachloro-m-xylene 4.9 / 3.6 Decachlorobiphenyl 8.6 / 9.2 Affected Samples:	Aroclor 1248	3.2 / 2.7	3.0		4.0		1.0	
Tetrachloro-m-xylene 4.9 / 3.6 Decachlorobiphenyl 8.6 / 9.2 Affected Samples:	Aroclor 1254	2.8 / 2.8				1.0		
Decachlorobiphenyl 8.6 / 9.2 Affected Samples:	Aroclor 1260	3.5 / 2.7						4.0
Affected Samples:	Tetrachioro-m-xylene	4.9 / 3.6						
	Decachlorobiphenyl	8.6 / 9.2						
	Affected Samples:							
6 6								
					øi			

CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO. K40333W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 SDG: 40193 BIO Contract: Case: **BIOTA** Phase Type: Lab Sample ID: 201581 10.0 Phase Weight: (g) **Date Received:** 10/15/93 Injection Volume: 1.0 (uL) Date Extracted: 04/14/94 Dilution Factor: 1.0 05/12/94 Date Analyzed: Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u>a</u>
12674-11-2	Aroclor-1016	0.050	υ
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.23	
11097-69-1	Aroclor-1254	0.19	
11096-82-5	Aroclor-1260	0.043	J

EPA SAMPLE NO. K40334W Lab Name: Aquatec, Inc. Lab Code: **IAUDA** Contract: 40193 91082 Case: BIO SDG:_ **BIOTA** Phase Type: Lab Sample ID: 201582 Phase Weight: 10.0 (g) Date Received: 10/15/93 Injection Volume: 1.0 (uL) Date Extracted: 04/14/94 2.0 Dilution Factor: Date Analyzed: 05/12/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Arocior-1248	0.10	U
11097-69-1	Aroclor-1254	0.99	
11096-82-5	Aroclor-1260	0.14	

EPA SAMPLE NO. K40335W Lab Name: Aquatec, Inc. Lab Code: **IAUDA** Case: SDG: Contract: 91082 BIO 40193 **BIOTA** Phase Type: Lab Sample ID: 201583 Phase Weight: 10.0 (g) **Date Received:** 10/15/93 1.0 04/14/94 Injection Volume: (uL) **Date Extracted:** 2.0 Date Analyzed: Dilution Factor: 05/12/94 Sulfur Clean-up: (Y/N) N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Arocior-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.90	
11096-82-5	Aroclor-1260	0.11	

EPA SAMPLE NO. K40336W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 SDG: 40193 Contract: Case: BIO **BIOTA** 201584 Phase Type: Lab Sample ID: 10.0 Phase Weight: **Date Received:** 10/15/93 (g) 1.0 Injection Volume: (uL) Date Extracted: 04/14/94 Dilution Factor: 1.0 Date Analyzed: 05/12/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	ι
11104-28-2	Aroclor-1221	0.050	ι
11141-16-5	Arocior-1232	0.050	
53469-21-9	Aroclor-1242	0.050	
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.52	
11096-82-5	Aroclor-1260	0.087	

EPA SAMPLE NO. K40337W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** Contract: 91082 Case: BIO SDG: 40193 **BIOTA** Lab Sample ID: 201585 Phase Type: 10.0 Date Received: Phase Weight: (g) 10/15/93 Injection Volume: 1.0 (uL) **Date Extracted:** 04/14/94 1.0 Date Analyzed: **Dilution Factor:** 05/12/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Arocior-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.76	
11096-82-5	Aroclor-1260	0.10	

EPA SAMPLE NO. K40338W Lab Code: **AQUAI** Lab Name: Aquatec, Inc. SDG:_ 91082 Case: BIO 40193 Contract: Phase Type: **BIOTA** 201586 Lab Sample ID: 10.0 Phase Weight: 10/15/93 (g) **Date Received:** 04/14/94 1.0 **Date Extracted:** Injection Volume: _ (uL) 2.0 Dilution Factor: Date Analyzed: 05/12/94 Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.30	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.76	
11096-82-5	Aroclor-1260	0.12	

EPA SAMPLE NO. K40376W Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 Case: BIO SDG: 40193 Contract: **BIOTA** Lab Sample ID: 201633 Phase Type: 10.0 Phase Weight: **Date Received:** 10/16/93 (g) Injection Volume: 1.0 (uL) **Date Extracted:** 04/14/94 Dilution Factor: 2.0 Date Analyzed: 05/12/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.71	
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.10	U

EPA SAMPLE NO. K40377W Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 Contract: Case: BIO SDG: 40193 Phase Type: **BIOTA** Lab Sample ID: 201634 Phase Weight: 10.0 (g) **Date Received:** 10/16/93 1.0 Injection Volume: (uL) 04/14/94 **Date Extracted:** 2.0 Dilution Factor: Date Analyzed: 05/13/94 Sulfur Clean-up: (Y/N)

CAS NO. COM	MPOUND	CONCENTRATION (mg/Kg)	
12674-11-2 Aroc	lor-1016	0.10	U
11104-28-2 Aroc	lor-1221	0.10	U
11141-16-5 Aroc	lor-1232	0.10	U
53469-21-9 Aroc	lor-1242	0.10	U
12672-29-6 Aroc	lor-1248	0.99	
11097-69-1 Aroci	or-1254	0.95	
11096-82-5 Arocl	or-1260	0.18	

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40378W Lab Code: Lab Name: Aquatec, Inc. **AQUAI** 40193 91082 BIO SDG: · Contract: Case: Phase Type: **BIOTA** Lab Sample ID: 201635 Phase Weight: 10.0 **Date Received:** 10/16/93 (g) 1.0 Date Extracted: 04/14/94 Injection Volume: (uL) Dilution Factor: 5.0 Date Analyzed: 05/13/94 Sulfur Clean-up: N (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)		
12674-11-2	Aroclor-1016	0.25	ι	
11104-28-2	Aroclor-1221	0.25	ι	
11141-16-5	Aroclor-1232	0.25	ι	
53469-21-9	Aroclor-1242	0.25	Į	
12672-29-6	Aroclor-1248	1.4		
11097-69-1	Aroclor-1254	1.0		
11096-82-5	Aroclor-1260	0.23	7	

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40379W Lab Code: Lab Name: Aquatec, Inc. **AQUAI** 91082 BIO SDG: 40193 Contract: Case: **BIOTA** 201636 Phase Type: Lab Sample ID: Phase Weight: 10.0 (g) **Date Received:** 10/16/93 Injection Volume: 1.0 (uL) **Date Extracted:** 04/14/94 Dilution Factor: 5.0 Date Analyzed: 05/13/94 (Y/N) Sulfur Clean-up:

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)		
12674-11-2	Aroclor-1016	0.25	U	
11104-28-2	Aroclor-1221	0.25	U	
11141-16-5	Aroclor-1232	0.25	U	
53469-21-9	Aroclor-1242	0.25	U	
12672-29-6	Aroclor-1248	2.2		
11097-69-1	Aroclor-1254	0.90		
11096-82-5	Aroclor-1260	0.25	U	

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40380W Lab Code: <u>AQUAI</u> Lab Name: Aquatec, Inc. 91082 40193 Case: BIO SDG: Contract: **BIOTA** Lab Sample ID: Phase Type: 201637 10.0 Phase Weight: (g) **Date Received:** 10/16/93 Injection Volume: 1.0 **Date Extracted:** 04/14/94 (uL) Dilution Factor: 2.0 05/13/94 Date Analyzed: Sulfur Clean-up: N (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.80	_
11097-69-1	Aroclor-1254	1.1	
11096-82-5	Arocior-1260	0.10	U

PESTICIDE ANALYSES

<u>Introduction</u>

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exception:

Instrument HP2404 - RTX-5 5/21/94 02:18

2-Bromobiphenyl

65.1%

Data for this compound in the associated samples K40333W, K40334W, K40335W, K40336W, K40337W and K40338W have been qualified as estimated due to the deviation.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40333W	Aldrin Heptachlor Epoxide 4,4'-DDE	36.8% 35.0% 36.8%
K40334W	Aldrin gamma-Chlordane 4,4'-DDE 4,4'-DDT	67.6% 97.9% 43.5% 591.1%
K40335W	Aldrin gamma-Chlordane 4,4'-DDE 4,4'-DDT	66.1% 65.1% 41.7% 550.3%
K40336W	Aldrin gamma-Chlordane 4,4'-DDE	42.4% 70.4% 43.4%
K40337W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE	54.9% 31.6% 92.1% 38.5%
K40338W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE	* 34.3% 53.8% 122.9% 32.5%
K40376W	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDE 4,4'-DDT	34.2% 142.8% 305.1% 49.2% 608.4%

K40377W	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDE 4,4'-DDT	27.1% 127.3% 337.1% 53.6% 624.7%
K40378W	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDE 4,4'-DDT	29.0% 155.7% 304.1% 51.5% 627.1%
K40379W	Aldrin gamma-Chlordane trans-Nonachtor 4,4'-DDE 4,4'-DDT	36.1% 157.4% 356.1% 45.6% 617.7%
K40380W	Aldrin gamma-Chlordane trans-Nonachlor 4,4'-DDE cis-Nonachlor	38.5% 140.4% 343.0% 47.4% 612.1%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All spike recoveries except Lindane in the matrix spike duplicate were above the acceptable control limit. The elevated recoveries can be attributed to positive interference from PCBs present in the matrix spike. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers have been added to the samples based on matrix spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

Data Completeness and Deliverables Is there a narrative or cover letter present? Are the samples numbers included in the narrative? X Are the sample chain-of-custodies present? X Do the chain-of-custodies indicate any problems with sample receipt or sample condition? Holding Times	x	
Are the samples numbers included in the narrative? X Are the sample chain-of-custodies present? X Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	x	
Are the sample chain-of-custodies present? Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	x	
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?	x	
sample receipt or sample condition?	<u> </u>	
Holding Times		
Have any holding times been exceeded?	<u> </u>	
Surrogate Recovery		
Are the surrogate recovery forms present?		
Are all the samples listed on the appropriate surrogate recovery form?		
Are the outliers correctly marked with an asterisk?		X
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	x	
If yes, were the samples reanalyzed?		X
Were the method blanks reanalyzed?		X
Matrix Spikes		
Is there a matrix spike recovery form present?		
Were matrix spikes analyzed at the required frequency?		
How many spike recoveries were outside of QC limits?		
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?		
_0 out of _4_		
Blanks		
Is the method blank summary form present?		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts presblanks, and MS/MSD?	sent for	ali samples,	
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X	·	
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	x		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	x		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?		X	
Is Form VII-2 present and complete for each mid-point standard analyzed?	x		
Are RPD values for all compounds < 25%?		X	
Analytical Sequence Check			

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Is Form VIII present and complete for each column and each period of analyses?	<u> </u>	·	
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification			
Is Form IX-1 present for each lot of Florisil cartridges used?	x		
Are all samples listed on the form?	X		
If GPC cleanup was performed, is Form IX-2 present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	X		
GPC calibration (80-110%)			X
Pesticide/PBB Identification			
Is a Form X present for every sample in which a pesticide or PCB was detected?	X		
Was GC/MS confirmation provided when required?			X
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?		x	
Were there any false negatives?			
Compound Quantitation and Reported Detection Limit	is		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates		- 	
Where field duplicates submitted with the samples?		x	

Pesticide/PBB Qualifier Summary Holding Time and Surrogates

Sample ID	Holding	Surrogates	Surrogates - Column 1		- Column 2
	Time	TCX	DCB	TCX	DQB
K40333W	OK for all	ок	ок	ок	ок
K40334W	samples				
K40335W					
K40336W					
K40337W					
K40338W					
K40376W					
K40376WMS				<u> </u>	
K40376WMSD					
K40377W			<u> </u>		
K40378W					
K40379W			<u></u>		
K40380W					

Surrogates: TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

Surrogate diluted out Recovery high

Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: <u>HP2404</u> Column: <u>RTX-5</u>

Date:	5/17/94	5/21	5/21	5/22	5/24	5/25
Time:	17:19	02:18	10:37	10:29	09:01	00:48
,	initial Cal.	Cont. Cal.	Cont. Cal	Gont. Cel.	Cont. Cal.	Cont. Cal.
	%RSD	%D	% D	\$2	% D	% D
2-Bromobiphenyl	ok	65.1	ok	ok	ok	ok
3-Bromobiphenyl						
4-Bromobiphenyl				.		
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptaclor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD			-			
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene				øi.		
Decachlorobiphenyl						
Affected Samples:		K40333W				
		K40334W				
		K40335W				
		K40336W				
		K40337W				
		K40338W				

Pesticide/PBB Calibration Summary - Page 2

Instrument: <u>HP2404</u> Column: <u>RTX-35</u>

Date:	5/17/94	5/21	5/21	5/22		
Time:	17:19	02:18	10:37	10:29	5/24	5/25
1	Initiaj Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	09:01 Cont. Cal.	00:48 Cont.
	%ASD	%D	% D	% D	%D	Cal
2-Bromobiphenyl	ok	ok	ok	ok	ok	% D
3-Bromobiphenyl					- OK	ok
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptaclor epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachior						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
oxaphene						
etrachioro-m-xylene						
ecachlorobiphenyl						
fected Samples:						
					<u> </u> -	
F						
<u></u>						·
<u> </u> -						

Corrected Sample Analysis Data Sheets

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.

40193

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201581

Date Received: 10/15/93

Date Extracted: 04/14/94

Date Analyzed: 05/21/94

Sulfur Clean-up: N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	.Q
2052-07-5	2-Bromobiphenyl	0.010	υ 7-
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.011	<u> </u>
1024-57-3	Heptachlor Epoxide	0.011	उ
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.011	Ç
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1.0

Dilution Factor:

Client ID No. Lab Name: K40334W Aquatec, Inc. Lab Code: AQUAI Contract: 91082 40193 Case: BIO SDG: Lab Sample ID: 201582 Phase Type: Biota 10/15/93 Date Received: Phase Weight: 10.0 Date Extracted: 04/14/94 Extraction: Soxhlet Date Analyzed: 05/21/94

Sulfur Clean-up:

N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	υsī	
2113-57-7	3-Bromobiphenyl	0.010	Ù	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.015	JN	
1024-57-3	Heptachlor Epoxide	0.011		
5103 74 2	gamma Chlordane	0.0076		R
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachior	0.0050	U	
72-55-9	4,4'-DDE	0.034	Li	ŀ
60-57-1	Dieldrin	0.010	Ū	Ì
72-54-8	4,4'-DDD	0:010	U	1
5103-73-1	cis-Nonachlor	0.0050	U	1
50 29 3	4,4'-DDT	0.012		IR
36355-01-8	Hexabromobiphenyl	0.020	U	\
8001-35-2	Toxaphene	0.20	U	1

 Lab Name:
 Aquatec, Inc.
 K40335W

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40193

 Lab Sample ID:
 201583

Phase Type:	Biota
Phase Weight:	10.0 g
Extraction:	Soxhlet
Dilution Factor:	1.0

Lab Sample ID:	201583
Date Received:	10/15/93
Date Extracted:	04/14/94
Date Analyzed:	05/21/94
Sulfur Clean-up:	N
Date Analyzed:	05/21/94

Client ID No.

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	α
2052-07-5	2-Bromobiphenyl	0.010 .	uз
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	Ū
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	υ.
309-00-2	Aldrin	0.017	JN
1024-57-3	Heptachlor Epoxide	0.013	
5103-74-2	gamma-Chlordane	0.0079	ゴル
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.031	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50 29 3	4,4'-DDT	0.011	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

R

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.
K40336W

40193

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201584

Date Received: 10/15/93

Date Extracted: 04/14/94

Date Analyzed: 05/21/94

Sulfur Clean-up: N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	UJ
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	Ü
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.013	17
1024-57-3	Heptachlor Epoxide	0.0090	
5103-74-2	gamma-Chlordane	0.0051	77
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.015	7
60-57-1	Dieldrin	0.010	υ
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Soxhlet

1.0

Extraction:

Dilution Factor:

Client ID No. K40337W Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 BIO Case: SDG: 40193 201585 Lab Sample ID: Phase Type: 10/15/93 Biota Date Received: Phase Weight: 10.0 Date Extracted: 04/14/94 9

Date Analyzed:

Sulfur Clean-up:

05/21/94

N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	UJ.	
2113-57-7	3-Bromobiphenyl	0.010	- U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachiorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U .	
309-00-2	Aldrin	0.014	JN	
1024-57-3	Heptachlor Epoxide	0.012	4	
5103-74-2	gamma-Chlordane	0.0063		R
5103-71-9	alpha-Chlordane	0.0050	U	•
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.027	5	
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.010	U	
5103-73-1	cis-Nonachlor	0.0050	U	
50-29-3	4,4'-DDT	0.010	U	
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

 Lab Name:
 Aquatec, Inc.
 K40338W

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40193

 Lab Sample ID:
 201586

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201586

Date Received: 10/15/93

Date Extracted: 04/14/94

Date Analyzed: 05/21/94

Sulfur Clean-up: N

Client ID No.

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	UJ.
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	υ
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.019	5
1024-57-3	Heptachlor Epoxide	0.016	JN
5103 74 2	gamma Chlordane	0.0058	F
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.027	7
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

1.0

Dilution Factor:

Client ID No. Lab Name: Aquatec, Inc. K40376W Lab Code: AQUAI Contract: 91082 BIO SDG: Case: 40193 Lab Sample ID: 201633 Phase Type: Biota 10/16/93 Date Received: Phase Weight: 10.0 Date Extracted: 04/14/94 Extraction: Soxhlet 05/21/94 Date Analyzed:

Sulfur Clean-up:

N.

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q.	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.040	7	
1024-57-3	Heptachlor Epoxide	0.034		
5103-74-2	gamma-Chlordane	0.014	f	२
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachlor	0.010		R
72-55-9	4,4'-DDE	0.043	7	
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.016		
5103-73-1	cis-Nonachior	0.0050	Ū	
50-29-3	4,4'-DDT	0.012		R
36355-01-8	Hexabromobiphenyl	0.020	υ	•
8001-35-2	Toxaphene	0.20	U	

Client ID No.

K40377W

40193

PESTICIDE, PBB ANALYSIS DATA SHEET

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO SDG:

201634 Lab Sample ID: 10/16/93 Phase Type: **Biota** Date Received: Phase Weight: 10.0 **Date Extracted:** 04/14/94 Extraction: Soxhlet Date Analyzed: 05/21/94 Dilution Factor: 1.0 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	n U	<u>.</u>
2113-57-7	3-Bromobiphenyl	0.010	U	İ
92-66-0	4-Bromobiphenyl	0.010	U	İ
118-74-1	Hexachlorobenzene	0.0050	U	İ
58-89-9	gamma-BHC	0.0050	. U	
309-00-2	Aldrin	0.044	7	İ
1024-57-3	Heptachlor Epoxide	0.038		i _
- 5103-74-2	gamma Chlordane	0.015		IR.
5103-71-9	alpha-Chlordane	0.0050	U	١.
39765-80-5	trans Nonachler	-0.0007		IR
72-55-9	4,4'-DDE	0.045	JN	l
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.016]
5103-73-1	cis-Nonachlor	0.0050	U	1
50-29-3	4,4'-DDT	0.013		1 R
36355-01-8	Hexabromobiphenyl	0.020	U	1
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO SDG: Lab Samole ID:

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201635

Date Received: 10/16/93

Date Extracted: 04/14/94

Date Analyzed: 05/21/94

Sulfur Clean-up: N

Client ID No.

K40378W

40193

COMPOUND	CONCENTRATION (mg/Kg)	a
2-Bromobiphenyl	0.010	U
3-Bromobiphenyl	0.010	U
4-Bromobiphenyl	0.010	U
Hexachlorobenzene	0.0050	U
gamma-BHC	0.0050	U
Aldrin	0.052	J
Heptachlor Epoxide	0.043	
gamma Chiordane	0.017	
alpha-Chlordane	0.0050	U
trans-Nonachlor	0.011	
4,4'-DDE	0.047	NC
Dieldrin	0.010	U
4,4'-DDD	0:018	
cis-Nonachlor	0.0050	U
4,4' DDT	0.014	
Hexabromobiphenyl	0.020	U
Toxaphene	0.20	U
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gamma Chlordane alpha-Chlordane trans Nensehler 4,4'-DDE Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	2-Bromobiphenyl 0.010 3-Bromobiphenyl 0.010 4-Bromobiphenyl 0.010 Hexachlorobenzene 0.0050 gamma-BHC 0.0050 Aldrin 0.052 Heptachlor Epoxide 0.043 gamma-Chlordane 0.017 alpha-Chlordane 0.0050 trans-Nensehler 0.011 4,4'-DDE 0.047 Dieldrin 0.010 4,4'-DDD 0.018 cis-Nonachlor 0.0050

05/21/94

N

PESTICIDE, PBB ANALYSIS DATA SHEET

Soxhlet

1.0

Extraction:

Dilution Factor:

Client ID No. K40379W Aquatec, Inc. Lab Name: Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40193 201636 Lab Sample ID: Phase Type: **Biota** Date Received: 10/16/93 Phase Weight: 10.0 04/14/94 Date Extracted:

Date Analyzed:

Sulfur Clean-up:

$\exists R$
$\exists R$
一,
二R

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40380W

40193

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201637

 Date Received:
 10/16/93

 Date Extracted:
 04/14/94

 Date Analyzed:
 05/21/94

 Sulfur Clean-up:
 N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.035	5	
1024-57-3	Heptachlor Epoxide	0.029		
5103-74-2	gamma-Chlordane	0.012		R
5103-71-9	alpha-Chlordane	0.0050	U	
39765-80-5	trans-Nonachlor	0.0088		R
72-55-9	4,4'-DDE	0.038	5	•
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.014		
5103-73-1	cis-Nonachlor	0.0050	U	
50-29-3	4,4'-DDT	0.011		R
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	Ü	

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- Duplicate analysis not within control limits.
- Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

The CRDL standard recovery was slightly above the acceptable limit. No data fell in the affected range; therefore, no qualifiers were added to the samples.

5

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The difference between laboratory duplicates was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the quidelines specified in the method.

Data Validation Checksheets

Inorganic Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	X		
SDG No.?	X		
Correct units?	×		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
ls the distillation log for mercury present?	×		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	×		
Cyanides			X
Is the data legible?	×		
Is the data properly labeled?	X		
Holding Times			
Were mercury analyses performed within 28 days?	<u> x</u>		

Inorganic Data Validation Checklist - Page 2

	YES	NO	NA
Were cyanide distillations performed within 14 days?			X
Were other metal analysis performed within 6 months?			X
Form I (Final Data)			
Are all forms complete?	<u> </u>		
Are correct units indicated on Form I's?	X		
Are all "less than IDL" values properly coded with "U"?	X		
Are the correct concentration qualifiers used with final data?	×		
Was a brief physical description of samples given on Form I's?		X	
Calibration			
Is a record of at least 2 point calibration present for ICP analysis?			x
Is a record of 5 point calibration present for Hg analysis?	X		
Is a record of 4 point calibration present for:			
Flame AA?			<u> </u>
Furnace AA?			X
Cyanides?			X
is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?			X
is correlation coefficient less than .995 for:			
Mercury Analysis?	X		
Cyanide Analysis?			x
Atomic Absorption Analysis?			X
Form II A (Initial and Continuing Calibration Verifica	tion)		
Present and complete for every metal and cyanide?	X		
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?			X
Hg (80-120 %R)?	X		
Cyanides (85-115 %R)?			X

Inorganic Data Validation Checklist - Page 3

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	s X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			<u>.</u>
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		×	
Is mid-range standard within control limits for cyanide (80-120 %R)			X
Form III (Initial and Continuing Calibration Blanks)	<u> </u>		
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after ever 10 samples or every 2 hours (which ever is more frequent)?	y X		
Are all calibration blanks (when IDL <crdl) (crdls)?<="" contract="" detection="" equal="" less="" limits="" or="" required="" td="" than="" the="" to=""><td>×</td><td></td><td></td></crdl)>	×		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			×
Form III (Preparation Blank)	Dis		
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	×		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		×	
CHDL when IDL is less than or equal to CRDL?			

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			X
Is concentration of prep. blank below the negative CRDL?		X	
Form IV (ICP Interference Check Sample)			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits (±20%)?			X
If no, is concentration of Al, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
Form V A (Spiked Sample Recovery - Pre-Digestion/	Pre-Distil	lation)	
Present and complete for:			
each SDG?	<u> </u>		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?	X		
If no, is sample concentration greater than or equal to four times spike concentration?			X
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?			X
Are any spike recoveries:			
less than 10%?		<u> </u>	
between 10-74%?		X	
between 126-200%?		X	
greater than 200%?		X	
Form VI (Lab Duplicates)			-
Present and complete for:			
each SDG?	x		
			

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			X
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		×	
Form VII (Laboratory Control Sample)			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
Form IX (ICP Serial Dilution)			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E"" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
≥100%?			X
Furnace Atomic Absorption (AA) QC Analysis			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA?			<u> </u>

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?	· ———-		X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?			X
Is analytical spike recovery outside the control limits (85-115%) for any sample?			X
Form VIII (Method of Standard Addition Results)			
Present?		X	
If no, is any Form I result coded with "S" or a "+"?		X	
Is coefficient of correlation for MSA less than 0.990 for any sample?			Х
Was MSA required for any sample but not performed?		X	
Is coefficient of correlation for MSA less than 0.995?			X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?			×
Was proper quantitation procedure followed as outlined in the SOW on page E-23?			X
Field Blank			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?			X
If no, was field blank value already rejected due to other QC criteria?			X
Form X, XI, XII (Verification of Instrumental Paramet	ers)		
Is verification report present for:			
Instrument Detection Limits (quarterly)?	X		
ICP Interelement Correlation Factors (annually)?			X
ICP Linear Ranges (quarterly)?			X
Form X (Instrument Detection Limits)			
Are IDLs present for:	•		
all the analytes?	X		
all the instruments used?	X		

	YES	NO	NA
Is IDL greater than CRDL for any analyte?		X	
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.			X
Was any sample result higher linear range of ICP.	-		X
Was any sample result higher than the highest calibration standard for non-ICP parameters?		×	
If yes for any of the above, was the sample diluted to obtain the result on Form 1?		<u></u>	X

Corrected Sample Analysis Data Sheets

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Code: AQUAI	Name: AQUAT	EC		Contract: 91	108	2	K40333W
Vel (low/med): LOW	ode: AQUAI	_ Ca	se No.: BI	SAS No.:	: _		SDG No.: 40193
Concentration Units (ug/L or mg/kg dry weight): MG/KG CAS No.	ix (soil/wa	ter): FISH			La	b Sampl	le ID: 201581
CAS No.	(low/med)	: LOW_	_		Da	te Rece	eived: 10/15/93
CAS No.	lids:	100.	0				
7429-90-5 Aluminum NR 7440-36-0 Antimony NR 7440-38-2 Arsenic NR 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-43-9 Cadmium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7439-89-6 Copper NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7440-02-0 Nickel NR 7440-02-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-28-0 Thallium NR 7440-28-0 Vanadium NR 7440-66-6 Zinc NR	Cond	centration	Units (ug	/L or mg/kg dry	7 W	veight):	MG/KG
7440-36-0 Antimony NR 7440-38-2 Arsenic NR 7440-39-3 Barium NR 7440-41-7 Beryllium NR 7440-70-2 Cadmium NR 7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7439-89-6 Iron NR 7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-97-6 Mercury 0.08 CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7440-22-4 Silver NR 7440-28-0 Thallium NR 7440-66-6 Zinc NR		CAS No.	Analyte	Concentration	С	Q	м
T440-36-0	-	7429-90-5	Aluminum		-		NR
7440-38-2					-		
T440-39-3					-		
7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-95-4 Magnesium 7439-96-5 Marcury 7440-02-0 Nickel 7440-02-0 Nickel 7440-02-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc NR NR NR NR NR NR NR NR NR NR NR NR NR	1				-		NR
7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-95-4 Magnesium 7439-97-6 Mercury 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7740-23-5 Sodium 7440-66-6 Zinc NR NR NR NR NR NR NR NR NR NR NR NR NR	j 7						
7440-47-3 Chromium NR 7440-48-4 Cobalt NR 7440-50-8 Copper NR 7439-89-6 Iron NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR							
7440-48-4							
7440-50-8 7439-89-6 Iron 7439-92-1 Lead 7439-95-4 Magnesium 7439-96-5 Manganese 7440-02-0 Nickel 7440-09-7 Potassium 7782-49-2 Selenium 7440-22-4 Silver 7440-23-5 Sodium 7440-28-0 Thallium 7440-66-6 Zinc NR NR NR NR NR NR NR NR NR NR NR NR NR					<u> </u>		
7439-89-6 Iron							
7439-92-1 Lead NR 7439-95-4 Magnesium NR 7439-96-5 Manganese NR 7440-02-0 Nickel NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR					_		
7439-95-4 Magnesium 7439-96-5 Manganese 7440-02-0 Mickel 7440-09-7 Potassium 7782-49-2 Selenium 7440-22-4 Silver 7440-23-5 Sodium 7440-62-2 Vanadium 7440-66-6 Zinc NR NR NR NR NR NR NR NR NR NR NR NR NR							
7439-96-5 Manganese	1				_		
7439-97-6 Mercury 0.08 CV 7440-02-0 Nickel NR 7440-09-7 Potassium NR 7782-49-2 Selenium NR 7440-22-4 Silver NR 7440-23-5 Sodium NR 7440-62-2 Vanadium NR 7440-66-6 Zinc NR					_		
7440-02-0 Nickel					_		
7440-09-7 Potassium	1			0.08	_		
7782-49-2 Selenium					_		
7440-22-4 Silver			l .		_		
7440-23-5 Sodium					_		
7440-28-0 Thallium NR NR NR 7440-62-2 Vanadium NR NR NR					<u> </u> _		
7440-62-2 Vanadium NR NR NR							
7440-66-6 Zinc NR	1 '				 -		
	1				l — l		
	1.	7440-66-6			lI		
	-		Cyanide		-		NK
lor Before: Clarity Before: Texture:	Before:		Clari	ty Before:	Ai.	-	Texture:
lor After: Clarity After: Artifacts: _	After:		Clari	ty After:		_	Artifacts:
mments:	ents:						

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

Name: AOUA	TEC		Contract: 9	1082		K40334W
				•		SDG No.: 40193
o couc. ngon		DC NO DI		-		
trix (soil/w	ater): FISH	_		Lab	Sampl	e ID: 201582
vel (low/med): LOW_	-		Dat	e Rece	ived: 10/15/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y we	ight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
				1_1_		
	7429-90-5			$ _ _$		NR
		Antimony_		_ _		NR
		Arsenic_		- -		NR
		Barium_		 - -		NR
		Beryllium		- -		NR NR
		Cadmium Calcium		- -		NR NR
		Chromium		- -		NR
		Cobalt		- -		NR
		Copper		1-1-		NR
	7439-89-6	Iron		- -		NR
		Lead		- -		NR
		Magnesium		[-[-		NR
		Manganese		- -		NR
		Mercury	0.03	- -		CV
		Nickel'		- -		NR
	7440-09-7			- -		NR
•	7782-49-2	Selenium		- -		NR
	7440-22-4	Silver		- -		NR
	7440-23-5	Sodium		- -		NR
		Thallium		- -		NR
	7440-62-2	Vanadium_		- -		NR
	7440-66-6	Zinc		- -		NR
		Cyanide		1-1-		NR
or Before:		Clari	ty Before:	<u>ø. </u>		Texture:
or After:		Clari	ty After:			Artifacts:

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		INORGANIC .	ANALYSES DATA S	SHE	ET	
→ Name: AQUATEC Contract: 91082						K40335W
ab Code: AQU	AI Ca	se No.: BI	O SAS No.	:		SDG No.: 40193
				T -1		.]. TD. 201502
atrix (SOII)	water): FISH	_		Trai	o samp	ple ID: 201583
evel (low/med	d): LOW_	_		Dat	te Red	ceived: 10/15/93
Solids:	100.	0			•	
Co	oncentration	Units (ug	/L or mg/kg dry	y we	eight	: MG/KG
	CAS No.	Analyte	Concentration	c	Q	м
	7429-90-5	Aluminum	\ 	- -		NR NR
	7440-36-0	Antimony		- -		NR
	7440-38-2	Arsenic -		- -		NR
	7440-39-3	Barium -		- -		- NR
	7440-41-7	Beryllium				NR
		Cadmium_				[NR
		Calcium_				NR
		Chromium_		_ _		NR
	7440-48-4			<u> _</u> _		NR
		Copper		_ _		NR
	7439-89-6	Iron		_ _		NR
	7439-92-1	Lead		_ -		NR
		Magnesium		_ -		NR
		Manganese	0.00	- -		NR CV
	7439-97-6	Mercury	0.02	- -		- NR
	7440-02-0 7440-09-7	Potassium		- -		- NR
	7782-49-2	Selenium		- -		- NR
		Silver		 - -		- NR
	7440-23-5	Sodium		- -	· — · · · · ·	- NR
		Thallium		-		- NR
		Vanadium -		- -		- NR
	7440-66-6	Zinc		- -		- NR
	7440 00 0	Cyanide		- -		NR
					-	
lor Before:		Clarit	y Before:	<u>•</u>		Texture:
lor After:		Clarit	y After:			Artifacts:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		INORGANIC	ANALYSES DATA :	SHE		
يى Name: AQU	ATEC		Contract: 93	108	32	K40336W
ab Code: AQU						SDG No.: 40193
atrix (soil/	water): FISH	<u>_</u>		La	ab Samp	ole ID: 201584
evel (low/med	i): LOW_	_		Da	te Rec	eived: 10/15/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y w	eight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		NR
	7440-36-0	Antimony_				NR
	7440-38-2	Arsenic_				NR
		Barium		_		NR
		Beryllium		_		NR
		Cadmium_ Calcium				NR NR
		Chromium		(-I		NR NR
		Cobalt		[-]		- NR
	1	Copper		-		- NR
		Iron		1-1		· NR
		Lead		1-1		NR
		Magnesium		-		NR
		Manganese		-		NR
		Mercury	0.04	1-1		cv
		Nickel -		-		NR
	7440-09-7	Potassium				NR
·		Selenium_		_		NR
		Silver		1=1		NR
		Sodium		_		NR
		Thallium_		l_I		NR
		Vanadium_		l_l		NR
	7440-66-6	Zinc		-		NR
		Cyanide				NR
lor Before:		Clari	ty Before:	ø.	_	Texture:
lor After:		Clari	ty After:		_	Artifacts:

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC		Contract: 9:	1082		K40337W
						SDG No.: 40193
atrix (soil/						Le ID: 201585
evel (low/me	d): LOW_			Dat	e Rece	eived: 10/15/93
Solids:	100.	0				
С	oncentration	Units (ug/	'L or mg/kg dry	y we	ight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
	7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-95-4 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-23-5 7440-28-0	Aluminum Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium Thallium Vanadium Zinc Cyanide	0.03			NR NR NR NR NR NR NR NR NR NR NR NR NR N
olor Before:		Clarit	y Before:	Øs.		Texture:
olor After:		Clarit	y After:			Artifacts:
omments:						

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

a. Na	ame: A	TAUQA	EC			Contract: 9:	LOS	32		K40338W
Lab Co	ođe: A	IAUQA	' <u></u>	Ca	se No.: BI	SAS No.:	: _		SDC	No.: 40193
Matrix	k (soi	ll/wa	ter):	FISH			L	ab Sampl	e II	D: 201586
Level	(low/	med)	:	LOW			Da	ate Rece	ived	1: 10/15/93
				_	_					
Soli	las:			100.	U		,			
		Con	centra	ation	Units (ug	/L or mg/kg dry	7 1	weight):	MG/	'KG
			CAS No	· ·	Analyte	Concentration	С	Q	М	
		-	7429-9	0-5	Aluminum		-		NR	
			7440-3		Antimony		-		NR	
			7440-3	8-2	Arsenic		_		NR	
			7440-3		Barium_		_		NR	
			7440-4		Beryllium		_		NR	
			7440-4 7440-7		CadmiumCalcium		_		NR NR	
			7440-4		Chromium		-		NR	
			7440-4		Cobalt		-		NR	
			7440-5		Copper		-		NR	
] ·	7439-8	9-6	Iron		-		NR	
		1.	7439-9	2-1	Lead				NR	
			7439-9		Magnesium		_		NR	
			7439-9		Manganese		_		NR	
			7439-9		Mercury_	0.03	_		CV	
			7440-0 7440-0		Nickel Potassium		_		NR NR	
			7440-0 7782 - 4		Selenium		 —		NR	
			7440-2		Silver		-		NR	
			7440-2		Sodium		-		NR	
			7440-2		Thallium		_		NR	
			7440-6		Vanadium -		_		NR	
			7440-6	6-6	Zinc		_		NR	
]-	 -		Cyanide		_		NR	
olor	Befor	e: _			Clarit	y Before:	li.		Text	ture:
olor	After	·: _			Clarit	y After:		<u>-</u>	Art:	ifacts:
ommer	nts:								···	

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name:	AQUATEC		Contract: 91	108	2	K40376W
		· ·				SDG No.: 40193_
Matrix (so	oil/water): FIS	H		La	b Samp	ole ID: 201633
Level (low	/med): LOW_	_		Da	te Red	ceived: 10/16/93
& Solids:	100	. 0				
	Concentration	units (ug	/L or mg/kg dry	7 W	eight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		- NR
	7440-36-0	Antimony				NR
	7440-38-2	Arsenic				NR
	7440-39-3			-		NR NR
	7440-41-7 7440-43-9			-		NR NR
	7440-70-2	Calcium		-		- NR
	7440-47-3	Chromium		-		NR
	7440-48-4			-		NR
	7440-50-8	Copper				NR
	7439-89-6	Iron				NR
	7439-92-1	Lead		-		NR
$\overline{}$	7439-95-4 7439-96-5	Magnesium Manganese		-		NR NR
	7439-97-6	Mercury	0.02	-		- CV
	7440-02-0	Nickel -		-		NR
	7440-09-7	Potassium				NR NR
	7782-49-2	Selenium_] NR
	7440-22-4	Silver		_		NR
	7440-23-5	Sodium		_		NR
	7440-28-0	Thallium_		_		NR
	7440-62-2 7440-66-6	Vanadium_ Zinc		-		NR NR
	7440 00 0	Cyanide		-		NR
				<u> </u>		
Color Befo	re:	Clarit	ty Before:	j ;	-	Texture:
color Afte	r:	Clarit	ty After:		-	Artifacts:
Comments:						

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Na	ame: AQUA	TEC		Contract: 9	108	32	K40377W
Lab Co	ode: AQUA	.I_ Ca	se No.: BI	o sas no.	: _		SDG No.: 40193_
Matrix	k (soil/w	rater): FISH	_		L	ab Sampl	e ID: 201634
Level	(low/med): LOW_	_		Da	ate Rece	ived: 10/16/93
% Soli	ids:	100.	0				
	Co	ncentration	Units (ug	/L or mg/kg dry	y v	weight):	MG/KG
		CAS No.	Analyte	Concentration	С	Q	м
		7429-90-5	Aluminum		-	 -	NR
			Antimony -		-		NR
		7440-38-2	Arsenic				NR
		7440-39-3	Barium		_		NR
		7440-41-7	Beryllium		 _		NR
		1	CadmiumCalcium		-		NR NR
		4	Chromium		-		NR NR
			Cobalt		-		NR
			Copper		-		NR
			Iron_		-		NR
		7439-92-1	Lead		-		NR
		7439-95-4	Magnesium		_		NR
		7439-96-5	Manganese				NR
		7439-97-6	Mercury_	0.03	B		CV
			Nickel		_		NR
	•		Potassium Selenium		-		NR
			Silver		-		NR NR
			Sodium		-		NR
			Thallium		-		NR
			Vanadium_	· · · · · · · · · · · · · · · · · · ·	-		NR
		7440-66-6	Zinc		-		nr
			Cyanide		_		NR
		l			۱	ll	
Color	Before:		Clarit	ty Before:	ø is	_	Texture:
Color	After:		Clarit	ty After:		_	Artifacts:
Commen	its:						

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC		Contract: 93	108	32	K40378W
			O SAS No.:			SDG No.: 40193_
atrix (soil/	water): FISH	<u>-</u>		La	b Sampl	e ID: 201635
evel (low/med	d): LOW_			Da	ite Rece	eived: 10/16/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	7 W	eight):	MG/KG
•	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum				NR
	7440-36-0	Antimony_		-1		NR
	7440-38-2	Arsenic		-1		NR
		Barium		-		NR
	7440-41-7	Beryllium	[]	-	 [NR
		Cadmium		-1		NR
	7440-70-2			-1		NR
		Chromium		-		NR
	7440-48-4	Cobalt		-		NR
	7440-50-8	Copper		-1)	NR
	7439-89-6	Iron		-		NR
	7439-92-1	Lead		-		NR
		Magnesium		-1		NR
<u> </u>		Manganese		-1		NR
		Mercury	0.02	-		CV
		Nickel -		-1		NR
	7440-09-7			-1		NR
	7782-49-2			-		NR
		Silver		-1		NR
	7440-23-5	Sodium		-	 -	NR
	7440-28-0	Thallium		-1		NR
	7440-62-2	Vanadium_		-1		NR
	7440-62-2	Zinc		-		NR
	7440 00 0	Cyanide		-		NR
		cyaniue_				
lor Before:		Clarit	ty Before:	6 .		Texture:
lor After:		Clarit	ty After:			Artifacts:
mments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

_o Name: AQUA	TEC		Contract: 91	1082	!	K40379W
ab Code: AQUA	I_ Ca	se No.: BIG	SAS No.:	:		SDG No.: 40193
trix (soil/w	water): FISH	_		Lab	Sampl	le ID: 201636
evel (low/med	l): LOW_			Dat	e Rece	eived: 10/16/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y we	eight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
	7429-90-5	Aliminim		-		NR
		Antimony		- -		NR NR
	7440-38-2	Arsenic		- -		NR
	7440-39-3	Barium		- -		NR
		Beryllium		- -		NR
	7440-43-9	Cadmium		- -		NR
		Calcium				NR
		Chromium		- -		NR
		Cobalt		- -		NR
		Copper		-1-	 [NR
	7439-89-6	Iron		- -		NR
		Lead		- -		NR
		Magnesium				NR
		Manganese		- -		NR
		Mercury	0.02	- -		CV
		Nickel -		- -		NR
		Potassium		- -		NR
•	7782-49-2	Selenium		- -		NR
		Silver -		- -		NR
	7440-23-5	Sodium		- -		NR
	7440-28-0	Thallium		- -		NR
	7440-62-2	Vanadium -		- -		NR
	7440-66-6	Zinc -		- -		NR
		Cyanide		- -		NR
lor Before:		Clarit	y Before:	<u> </u>	-	Texture:
lor After:		Clarit	y After:			Artifacts:
mments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC		Contract: 9	1082	K40380W
					SDG No.: 40193
atrix (soil/	water): FISH	_		Lab Sam	ple ID: 201637
evel (low/med	i): LOW_			Date Re	ceived: 10/16/93
Solids:	100.	0			
Co	oncentration	Units (ug	/L or mg/kg dry	y weight): MG/KG
	CAS No.	Analyte	Concentration	c Q	м
					_
	7429-90-5			_	
•		Antimony_		-	NR
		Arsenic_		-	NR
		Barium		-	NR
		Beryllium Cadmium			NR
		Calcium			NR NR
		Chromium		-	
		Cobalt			NR NR
	1				$-\left \frac{NR}{NR} \right $
	7440-50-8 7439-89-6	Copper			$-\left \frac{NR}{NR} \right $
		Iron		-	
	4				NR
		Magnesium		-	NR NR
		Manganese	0.02		
	E .	Mercury_ Nickel	0.02		CV
		Potassium			- NR
		Selenium		-	- NR
	7440-22-4			-	- NR
		Sodium			- NR
		Thallium			$-\left \frac{NR}{NR} \right $
		Vanadium_			- NR
	7440-62-2	Zinc			- NR
	7440-00-0	Cyanide		-	$-\left \frac{NR}{NR}\right $
		· —			- (
lor Before:		Clari	ty Before:	<u> </u>	Texture:
lor After:		Clari	ty After:		Artifacts:
mments:					

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	%Lipid
K40333W	Trowbridge Dam - White Sucker	male	0.88
K40334W	Trowbridge Dam - White Sucker	male	0.83
K40335W	Trowbridge Dam - White Sucker	male	0.59
K40336W	Trowbridge Dam - White Sucker	male	0.55
K40337W	Trowbridge Dam - White Sucker	male	1.01
K40338W	Trowbridge Dam - White Sucker	male	1.29
K40376W	Plainwell Dam - White Sucker	male	3.40
K40377W	Plainwell Dam - White Sucker	male	3.30
K40378W	Plainwell Dam - White Sucker	male	3.78
K40379W	Plainwell Dam - White Sucker	female	2.76
K40380W	Plainwell Dam - White Sucker	female	2.96

DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 40202

PCB, PESTICIDE AND MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc. Colchester, Vermont

Review performed by:

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40202 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and the corrected sample results. Analyses were performed on the following samples:

Sample ID Lab		Species	Description	Sample Location	Analysis		
					PCB	%Lipid	
K40360F	208350	carp	fillet	Plainwell Dam	x	х	
K40360R	208351	carp	carcass	Plainwell Dam		х	
K40365F	208352	carp	fillet	Plainwell Dam	X	x	
K40365R	208353	carp	carcass	Plainwell Dam		x	
K40366F	208354	carp	filiet	Plainwell Dam	х	x	
K40366R	208355	carp	carcass	Plainwell Dam		x	
K40367F	208356	carp	fillet	Plainwell Dam	X	x	
K40367R	208357	carp	carcass	Plainwell Dam		x	
K40368F	208358	carp	fillet	Plainwell Dam	X	×	
K40368R	208359	carp	carcass	Plainwell Dam		х	
K40391F	208360	carp	fillet	Mosel Ave.	X	x	
K40391R	208361	carp	carcass	Mosel Ave.		х	
K40424F	208364	carp	fillet	Ceresco	X	x	
K40424R	208365	carp	carcass	Ceresco		х	
K40425F	208366	carp	fillet	Ceresco	X	х	
K40425R	208367	carp	carcass	Ceresco		х	
K40426F*	208368	carp	fillet	Ceresco	x	x	
K40426R	208369	carp	carcass	Ceresco		x	
K40429F	214892	сагр	fillet	Ceresco Reservoir	x	х	
K40429R	214892	carp	carcass	Ceresco Reservoir		х	
K40431F	214893	carp	fillet	Ceresco Reservoir	x	x	
K40431R	214894	carp	carcass	Ceresco Reservoir		х	

^{*} MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

<u>Calibration</u>

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40360F, K40366F, K40368F, K40391F and K40426MSD. No qualifiers were added to these samples based on the deviations. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference (RPD) between recoveries were within acceptable control limits. All matrix spike blank recoveries were also within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	TES	NO	NA
Data Completeness and Deliverables		·	
Is there a narrative or cover letter present?	<u>X</u>		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		x	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	×		
If yes, were the samples reanalyzed?		X	
Matrix Spikes			•
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	×		
How many spike recoveries were outside of QC limits?			
0 out of4			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
0out of2			
Blanks			
is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			×
Are there field/rinse/equipment blanks associated with every sample?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Aroclor 1016/1260	X		
Aroclor 1221	X		
Aroclor 1232	X		
Aroclor 1242	X		
Aroclor 1248			
Aroclor 1254	X		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?			
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?*	×		
Are %D values for all compounds within limits (less than 15%)?	×		
Analytical Sequence Check			
Is a analytical sequence form present and complete for each column and each period of analyses?	X		
Was the proper analytical sequence followed?	X		

PCB Data Review Checklist - Page 3

	YES	NO	NA
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	x		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
Is both a combined and single column Aroclor Identification Report present for every sample?	x		
Do the combined column and individual column Aroclor identifications agree?	X		<u> </u>
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			X
Compound Quantitation and Reported Detection Li	mits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality	. — -		
Were the baselines stable?	X		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates		<u></u>	
Where field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding	Surrogates	- Column 1	Surrogates - Column		
	Time	TCX	DCB	TCX	BCB	
K40360F	OK for all	↓ (52)	ОК	↓ (57)	ок	
K40365F	samples					
K40366F		↓ (55)				
K40267F						
K40368F		Į (56)				
K40391F		↓ (56)		↓ (57)		
K40424F						
K40425F						
K40426F						
K40426FMS						
K40426FMSD		↓ (53)				
K40429F						
K40431F						

Surrogate Standards TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogates diluted out

Recovery high Recovery low

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2087 Column: RTX-35 / RTX-5

Date:	5/1/94 2255	5/8	5/3	5/4	5/4	5/4	5/4
Time:	to 5/2/94 1916	1948	2024	0355	0411	1122	115B
1	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Gont. Cal.	Cont. Cal.
	%RSD	%D	% D	% D	% D	% D	% D
Aroclor 1016	5.7 / 4.0				6.5		
Arocior 1221	6.4 / 3.4					; 	
Aroclor 1232	4.1 / 2.5		<u> </u>			·	
Aroclor 1242	4.6 / 4.2						11.0
Aroclor 1248	5.1 / 4.5	3.5	<u> </u>	9.5		8.5	
Aroclor 1254	4.9 / 4.8						
Aroclor 1260	3.6 / 3.0		4.0				
Tetrachloro-m-xylene	6.6 / 4.5						
Decachlorobiphenyl	6.5 / 8.5	- <u>-</u>					
Affected Samples:							
	·						
·			L			· 	
	<u> </u>						
							
				•			
Í							
}	<u></u>		[

PCB Calibration Summary - Page 2

Instrument: <u>HP2087</u> Column: <u>RTX-35 / RTX-5</u>

Date:		5/4	5/4	5/5	5/5	5/6	5/6
Time:		1833	1908	1752	1828	0243	0319
	Initial Cal.	Cont.	Gont.	Cont.	Cont.	Cont.	Cont.
,	woon	Cat.	Cal.	Gal.	Cal. %D	Cal. %D	Cal.
Arocior 1016	% ASD	760	%D	% 0	760	7-0	% D
Aroclor 1221			 				
Aroclor 1232			 			<u></u>	
Aroclor 1242	<u> </u>	<u> </u>	 		15.0		
Aracior 1248		5.5		14.5		13.5	
Arocior 1254			9.5				11.5
Aroclor 1260							
Tetrachloro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							
							T-T-1
1							
_							
<u> </u>							·
<u> </u>			<u> </u>				
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1				l 			
-							
-			<u> </u>				

CORRECTED ANALYSIS SUMMARY FORMS

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40360F Lab Name: Aquatec, Inc. Lab Code: **IAUDA** Contract: 91082 Case: BIO SDG: 40202 Phase Type: **BIOTA** Lab Sample ID: 208350 10.0 Phase Weight: (g) **Date Received:** 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 03/30/94 10.0 05/04/94 Dilution Factor: Date Analyzed:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	٥
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	3.6	
11097-69-1	Aroclor-1254	3.1	
11096-82-5	Aroclor-1260	0.50	U

Sulfur Clean-up:

N

(Y/N)

FORM 1 AROCLOR ANALYSIS DATA SHEET

EPA SAMPLE NO. K40365F Aquatec, inc. Lab Code: AQUAI Lab Name: 91082 BIO SDG: 40202 Contract: Case: **BIOTA** 208352 Phase Type: Lab Sample ID: Phase Weight: 10.0 (g) **Date Received:** 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 03/30/94 Dilution Factor: 5.0 Date Analyzed: 05/04/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	ι
11104-28-2	Aroclor-1221	0.25	l
11141-16-5	Aroclor-1232	0.25	l
53469-21-9	Aroclor-1242	0.25	ι
12672-29-6	Aroclor-1248	2.8	
11097-69-1	Aroclor-1254	2.1	
11096-82-5	Aroclor-1260	0.25	ι

EPA SAMPLE NO. K40366F Lab Name: Aquatec, Inc. Lab Code: **IAUDA** 91082 40202 Contract: Case: BIO SDG: **BIOTA** Phase Type: Lab Sample ID: 208354 10.0 Phase Weight: (g) Date Received: 10/16/93 Injection Volume: 1.0 (uL) **Date Extracted:** 03/30/94 10.0 Dilution Factor: Date Analyzed: 05/04/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Arocior-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	1.5	
11097-69-1	Aroclor-1254	2.8	
11096-82-5	Aroclor-1260	1.4	

EPA SAMPLE NO. K40367F Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 40202 91082 BIO SDG: Contract: Case: Lab Sample ID: **BIOTA** Phase Type: 208356 10.0 Phase Weight: (g) **Date Received:** 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 03/30/94 2.0 Dilution Factor: Date Analyzed: 05/04/94 Sulfur Clean-up: (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	Ų
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Arocior-1254	0.91	
11096-82-5	Aroclor-1260	0.15	

EPA SAMPLE NO. K40368F Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 40202 Case: , Contract: BIO SDG: Phase Type: **BIOTA** Lab Sample ID: 208358 Phase Weight: 10.0 (g) Date Received: 10/16/93 1.0 Injection Volume: (uL) **Date Extracted:** 03/30/94 Dilution Factor: 10.0 05/05/94 Date Analyzed: Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u>a</u>
12674-11-2	Aroclor-1016	0.50	υ
11104-28-2	Arocior-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	4.2	
11097-69-1	Aroclor-1254	2.5	
11096-82-5	Aroclor-1260	0.50	U

EPA SAMPLE NO. K40391F AQUAI Lab Name: Aquatec, Inc. Lab Code: Contract: 91082 Case: BIO SDG: 40202 Phase Type: **BIOTA** Lab Sample ID: 208360 Phase Weight: 10.0 **Date Received:** 10/16/93 (g) Injection Volume: 03/30/94 1.0 (uL) **Date Extracted:** Dilution Factor: 5.0 05/04/94 Date Analyzed: Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Arocior-1016	0.51	
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.9	
11096-82-5	Aroclor-1260	0.18	J

Lab Code:

Case:

Lab Name: Aquatec, Inc.

91082

Contract:

K40424F SDG: 40202

EPA SAMPLE NO.

Phase Type: **BIOTA** Lab Sample ID: 208364 Phase Weight: 10.0 **Date Received:** 11/10/93 (g) Injection Volume: (uL) 1.0 Date Extracted: 03/31/94 05/04/94 Dilution Factor: 1.0 Date Analyzed: Sulfur Clean-up: (Y/N) N

AQUAI

BIO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	٥
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	บ
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.093	
11096-82-5	Arocior-1260	0.076	

EPA SAMPLE NO. 'K40425F IAUDA Lab Name: Aquatec, Inc. Lab Code: 40202 91082 Case: Contract: BIO SDG: _ Phase Type: **BIOTA** Lab Sample ID: 208366 Phase Weight: 10.0 (g) Date Received: 11/10/93 Injection Volume: 1.0 03/31/94 (uL) **Date Extracted:** 1.0 05/04/94 Dilution Factor: Date Analyzed: Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	(
11104-28-2	Aroclor-1221	0.050	Į
11141-16-5	Aroclor-1232	0.050	Ţ
53469-21-9	Aroclor-1242	0.050	
12672-29-6	Arocior-1248	0.050	
11097-69-1	Aroclor-1254	0.047	
11096-82-5	Arocior-1260	0.036	

Lab Code:

Case: _

EPA SAMPLE NO.

K40426F

AQUAI

BIO SDG: 40202

Lab Sample ID: 208368

Date Received: 11/10/93

Phase Type:	BIOTA	
Phase Weight:	10.0	(g)
Injection Volume:	1.0	(uL)
Dilution Factor:	1.0	

Lab Name: Aquatec, Inc.

91082

Contract:

 Date Extracted:
 03/31/94

 Date Analyzed:
 05/04/94

 Sulfur Clean-up:
 N
 (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u>a</u>
12674-11-2	Arocior-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.030	J
11096-82-5	Aroclor-1260	0.025	J

EPA SAMPLE NO. K40429F Lab Name: Aquatec, Inc. Lab Code: **IAUDA** Contract: 91082 Case: BIO SDG: 40202 Phase Type: **BIOTA** Lab Sample ID: 214891 Phase Weight: 10.0 (0) **Date Received:** 11/10/93 1.0 Injection Volume: (uL) **Date Extracted:** 03/30/94 1.0 Dilution Factor: Date Analyzed: 05/03/94 Sulfur Clean-up: (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.050	U
11097-69-1	Aroclor-1254	0.062	•
11096-82-5	Aroclor-1260	0.039	J

EPA SAMPLE NO. K40431F **AQUAI** Lab Code: Lab Name: Aquatec, Inc. 40202 Contract: 91082 Case: BIO SDG: **BIOTA** Lab Sample ID: Phase Type: 214893 10.0 Phase Weight: **(g)** Date Received: 11/10/93 Injection Volume: 1.0 (uL) Date Extracted: 03/30/94 Dilution Factor: _ 1.0 Date Analyzed: 05/03/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.050	u
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Arocior-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	L
12672-29-6	Arocior-1248	0.050	U
11097-69-1	Aroclor-1254	0.030	J
11096-82-5	Aroclor-1260	0.027	J

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. All samples were originally analyzed within the specified holding times. The dilutions of samples K40365F and K40368F were, however, analyzed over the specified holding time. All data for the dilutions have been qualified as estimated based on the deviation.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

All surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40360F	2-Bromobiphenyl Aldrin gamma-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	151.9% 30.7% 88.5% 32.0% 32.4% 652.8%
K40365F	Aldrin gamma-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	30.5% 71.0% 40.2% 44.4% 620.0%
K40365FDL	2-Bromobiphenyl Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	151.9% 31.1% 30.0 75.0% 41.8% 26.1% 728.6%
K40366F	2-Bromobiphenyl 3-Bromobiphenyl Aldrin gamma-Chlordane 4,4'-DDE 4,4'-DDT	142.4% 144.0% *32.5% 100.0% 29.9% 363.1%
K40367F	Aldrin gamma-Chlordane 4,4'-DDE	35.0% 71.4% 41.9%

K40368F	3-Bromobiphenyl Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	62.2% 25.5% 112.5% 58.8% 572.7%
K40368FDL	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	29.0% 37.3% 95.2% 60.2% 680.0%
K40391F	Aldrin gamma-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	37.8% 82.4% 32.9% 61.5% 600.0%
K40424F	2-Bromobiphenyl	32.6%

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries were above the acceptable control limits. All recoveries in the matrix spike blank were, however, within acceptable control limits. The elevated matrix spike recoveries are believed to be attributable to both positive interference from the sample matrix and partial evaporation of the spike extracts after concentration. No qualifiers were added to the samples based on matrix spike performance.

8. General Comments

The recommended data usage for the sample dilutions is as follows:

K40365F and K40365FDL

The data from sample K40365F should be used for all compounds except Aldrin. The data from the dilution K40365FDL should be used for Aldrin only.

K40368F and K40368FDL

The data from sample K40368F should be used for all compounds except Aldrin. The data from the dilution K40368FDL should be used for Aldrin only.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	<u> x</u>		
Are the sample chain-of-custodies present?	<u> </u>		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?	<u> </u>	<u> </u>	
Surrogate Recovery			
Are the surrogate recovery forms present?	X	·	
Are all the samples listed on the appropriate surrogate recovery form?	X		
Are the outliers correctly marked with an asterisk?			X
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?		X	
If yes, were the samples reanalyzed?			X
Were the method blanks reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			<u></u>
8 out of8			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
Is the method blank summary form present?	<u> </u>		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?		X	
Do any trip/field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts pre blanks, and MS/MSD?	sent for a	all samples	,
peak resolution check	X		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration	X		
Pesticide/PBB mid-point standard	X		
instrument blanks	X	 _	
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?	X		
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?	X		
Analytical Sequence Check		· ·	
Is Form VIII present and complete for each column and each period of analyses?	X		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	X		
Cleanup Efficiency Verification		-	
Is Form IX-1 present for each lot of Florisil cartridges used?	<u>x</u>		
Are all samples listed on the form?	X		
If GPC cleanup was performed, is Form IX-2 present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	X		
GPC calibration (80-110%)			X
Pesticide/PBB Identification			
Is a Form X present for every sample in which a pesticide or PCB was detected?	X		
Was GC/MS confirmation provided when required?			X
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?		X	
Were there any false negatives?		X	
Compound Quantitation and Reported Detection Limit	ls	<u> </u>	
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	X		
Chromatogram Quality			
Were the baselines stable?	<u> </u>		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Where field duplicates submitted with the samples?		X	

Pesticide/PBB Qualifier Summary Holding Time and Surrogates

Sample ID	Holding	Surregates	- Column 1	Surrogates	- Column 2
	Time	TCX	DCB	TCX	DCB
K40360F		ок	ок	ок	ок
K40365F					
K40365FDL	+1				
K40366F					
K40367F					
K40368F					
K40368FDL	+1				
K40391F					
K40424F					
K40425F					
K40426F					
K40426FMS					
K40426FMSD					
K40429F					
K40431F					

Surrogates:

TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogate diluted out

Recovery high

↓ Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: <u>HP2404</u>
Column: <u>RTX-5</u>

Date:	4/26/94	5/2	5/2	5/2			
Time:	20:30	01:43	14:08	22:28			
ı	Initial Cal.	Cont. Cai.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont.
	%RSD	% D	%D	% D	%D	%D	%D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachlorobenzene		·		<u> </u>		<u> </u>	
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor						<u>.</u>	
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene						<u> </u>	
Tetrachloro-m-xylene					ø.		
Decachlorobiphenyl							
Affected Samples:							
Γ							

Pesticide/PBB Calibration Summary - Page 2

Instrument: <u>HP2404</u> Column: <u>RTX-35</u>

Date:	4/26/94	5/2	5/2	5/2			
Time:	20:30	01:43	14:08	22:28			
N	initial Cal.	Cont. Cal.	Gont. Cal.	Cont. Gal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	%RSD	%D	%D	% D	% D	% D	% D
2-Bromobiphenyl	ok	ok	ok	ok			
3-Bromobiphenyl	<u></u>					l 	
4-Bromobiphenyl							
Hexachlorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chiordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							<u> </u>
Toxaphene							<u> </u>
Tetrachloro-m-xylene					-		
Decachlorobiphenyl							
Affected Samples:							
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Pesticide/PBB Calibration Summary - Page 3

Instrument: <u>HP2404</u> Column: <u>RTX-5</u>

Date:	5/8/94	5/9	5/10				
Time:	17:57	18:35	02:55				
v	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Gont. Cal.	Cont. Cal.	Cont. Cel.
	%RSO	% D	% D	% D	%D	% D	% D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachiorobenzene							
gamma-BHC (Lindane)							
Aldrin							
Heptacior epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachior							
4,4'-DDE							
Dieldrin							
4,4'-DDD							
cis-Nonachlor							
4,4'-DDT							
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachioro-m-xylene					a i.		
Decachlorobiphenyl							
Affected Samples:							
Γ							

Pesticide/PBB Calibration Summary - Page 4

Instrument: <u>HP2404</u>
Column: <u>RTX-35</u>

Date:	5/6/94	5/9	5/10				
Time:	17:57	18:35	02:55				
	Initial Cal	Cont. Cal.	Gont, Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	*ASD	% D	%D	% D	% 0	% D	%D
2-Bromobiphenyl	ok	ok	ok				
3-Bromobiphenyl							
4-Bromobiphenyl							
Hexachiorobenzene							
gamma-BHC (Lindane)					· · · · · · · · · · · · · · · · · · ·		
Aldrin							
Heptaclor epoxide							
gamma-Chlordane							
alpha-Chlordane							
trans-Nonachlor							
4,4'-DDE							
Dieldrin							
4,4'-DDD						<u> </u>	
cis-Nonachlor							
4,4'-DDT				·			
Hexabromobiphenyl (BP-6)							
Toxaphene							
Tetrachioro-m-xylene							
Decachlorobiphenyl							
Affected Samples:							
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Corrected Sample Analysis Data Sheets

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

2.0

Client ID No.
K40360F

40202

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor:

 Lab Sample ID:
 208350

 Date Received:
 10/16/93

 Date Extracted:
 03/30/94

SDG:

Date Analyzed: _____ Sulfur Clean-up:

03/30/94 05/09/94 N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052 07 5	2-Bromobiphonyl	0.054	
2113-57-7	3-Bromobiphenyl	0.020	U
92-66-0	4-Bromobiphenyl	0.020	U
118-74-1	Hexachlorobenzene	0.010	U
58-89-9	gamma-BHC	0.010	U
309-00-2	Aldrin	0.16	+ EJ
1024-57-3	Heptachlor Epoxide	0.11	
5103-74-2	gamma-Chlordane	0.061	JN
5103-71-9	alpha-Chlordane	0.049	
39765-80-5	trans-Nonachlor	0.010	U
72-55-9	4,4'-DDE	0.18	7
60-57-1	Dieldrin	0.020	U
72-54-8	4,4'-DDD	0.072	
5103-73-1	cis-Nonachlor	0.037	7
50-29-3	4,4'-DDT	0.036	
36355-01-8	Hexabromobiphenyl	0.040	U
8001-35-2	Toxaphene	0.40	U

. Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40365F

40202

-R

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 208352

 Date Received:
 10/16/93

 Date Extracted:
 03/30/94

 Date Analyzed:
 05/02/94

 Sulfur Clean-up:
 N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.10 -0.082-	- T.C. —X
1024-57-3	Heptachlor Epoxide	0.043	
5103-74-2	gamma-Chiordane	0.031	JN
5103-71-9	alpha-Chlordane	0.022	
39765-80-5	trans-Nonachlor	0.0050	υ
72-55-9	4,4'-DDE	0.087	4
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.035	
5103-73-1	cis-Nonachlor	0.018	7
50 29 3	4,4' DDT	0.020	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.
K40366F

40202

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 208354

 Date Received:
 10/16/93

 Date Extracted:
 03/30/94

 Date Analyzed:
 05/02/94

 Sulfur Clean-up:
 N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052 07 5	2 Bromobiphenyl	0.059		1 _R
2113 57 7	3-Bromobiphenyl	0.025		IR.
92-66-0			U	1
118-74-1			U	1
58-89-9		0.0050	Ū	1
309-00-2	Aldrin	0.077	7	1
1024-57-3	Heptachlor Epoxide	0.047		1
5103 74 2	gamma-Chlordane	0.025		1R
5103-71-9	alpha-Chlordane	0.013		7'`
39765-80-5	trans-Nonachior	0.0050	U	7
72-55-9	4,4'-DDE	0.13	ज	7
60-57-1	Dieldrin	0.010	U	7
72-54-8	4,4'-DDD	0.025		7
5103-73-1	cis-Nonachlor	0.0050	U	7
50-29-3	4,4'-DDT	0.036		3R
36355-01-8	Hexabromobiphenyl	0.020	U]'`
8001-35-2	Toxaphene	0.20	U	7
	2052 07 5 2113 57 7 92-66-0 118-74-1 58-89-9 309-00-2 1024-57-3 5103-74-2 5103-71-9 39765-80-5 72-55-9 60-57-1 72-54-8 5103-73-1 50-29-3 36355-01-8	2052 07 5 2 Bromobiphenyl 2113-57 7 3 Bromobiphenyl 92-66-0 4-Bromobiphenyl 118-74-1 Hexachlorobenzene 58-89-9 gamma-BHC 309-00-2 Aldrin 1024-57-3 Heptachlor Epoxide 5103-74-2 gamma-Chlordane 5103-71-9 alpha-Chlordane 39765-80-5 trans-Nonachlor 72-55-9 4,4'-DDE 60-57-1 Dieldrin 72-54-8 4,4'-DDD 5103-73-1 cis-Nonachlor 50-29-3 4,4'-DDT 36355-01-8 Hexabromobiphenyl	Comp/Kg Comp/Kg	Comp/Kg Composition Com

Client ID No. K40367F Lab Name: Aquatec, inc. Lab Code: AQUAI Contract: 91082 40202 Case: BIO SDG: Lab Sample ID: 208356 Phase Type: **Biota** Date Received: 10/16/93 Phase Weight: 10.0 **Date Extracted:** 03/30/94 Extraction: Soxhlet 05/02/94 Date Analyzed: Dilution Factor: 1.0 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	V
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.040	7
1024-57-3	Heptachlor Epoxide	0.023	
5103-74-2	gamma-Chlordane	0.014	JN
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	Ü
72-55-9	4,4'-DDE	0.043	J
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.Q13	
5103-73-1	cis-Nonachlor	0.013	
50-29-3	4,4'-DDT	0.010	Ü
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

 Lab Name:
 Aquatec, Inc.
 K40368F

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40202

 Lab Sample ID:
 208358

 Thase Type:
 Biota
 Date Received:
 10/16/93

Client ID No.

Extraction:	Soxhlet	Date Analyzed:	05/02/94
Dilution Factor:	1.0	Sulfur Clean-up:	N

COMPOUND	CONCENTRATION (mg/Kg)	Q	
2-Bromobiphenyl	0.010	U	
3-Bromobiphenyl	0.0074	JN	
4-Bromobiphenyl	0.010	U	
Hexachlorobenzene	0.0050	U	
gamma-BHC	0.0050	U	
Aldrin	0.14 0.11	* DJ	
Heptachlor Epoxide	0.055	5	
gamma-Chlordana	0.032		-R
alpha-Chlordane	0.015		
trans-Nonachior	0.0050	U	
4,4'-DDE	0.068	75	
Dieldrin	0.010	U	
4,4'-DDD	0.026		
cis-Nonachlor	0.025		
4,4' DDT	0.022		-R
Hexabromobiphenyl	0.020	U	
Toxaphene	0.20	U	
	2-Bromobiphenyl 3-Bromobiphenyl 4-Bromobiphenyl Hexachlorobenzene gamma-BHC Aldrin Heptachlor Epoxide gamma-Chlordane alpha-Chlordane trans-Nonachlor 4,4'-DDE Dieldrin 4,4'-DDD cis-Nonachlor 4,4'-DDT Hexabromobiphenyl	2-Bromobiphenyl 0.010 3-Bromobiphenyl 0.0074 4-Bromobiphenyl 0.010 Hexachlorobenzene 0.0050 gamma-BHC 0.0050 Aldrin 0.14 0.11 Heptachlor Epoxide 0.055 gemma-Chlordane 0.015 trans-Nonachlor 0.0050 4,4'-DDE 0.068 Dieldrin 0.010 4,4'-DDD 0.026 cis-Nonachlor 0.025	Comp/Kg Comp/Kg

 Lab Name:
 Aquatec, Inc.
 K40391F

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40202

 Lab Sample ID:
 208360

 thase Type:
 Biota
 Date Received:
 10/16/93

Client ID No.

		Lab Sample ID:	208360
Phase Type:	Biota	Date Received:	10/16/93
Phase Weight:	10.0 g	Date Extracted:	03/30/94
Extraction:	Soxhlet	Date Analyzed:	05/02/94
Dilution Factor:	1.0	Sulfur Clean-up:	N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	α
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.040	
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.037	J
1024-57-3	Heptachlor Epoxide	0.020	JN
5103-74-2	gamma-Chiordane	0.017	
5103-71-9	alpha-Chlordane	0.015	
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.076	5
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.025	
5103-73-1	cis-Nonachlor	0.013	JN
50 29 3	4,4' DDT	0.016	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Soxhlet

1.0

Extraction:

Dilution Factor:

Client ID No. Aquatec, Inc. Lab Name: K40424F Lab Code: AQUAI Contract: 91082 BIO Case: SDG: 40202 Lab Sample ID: 208364 Phase Type: **Biota** Date Received: 11/10/93 Phase Weight: 10.0 Date Extracted: 03/31/94

Date Analyzed:

Sulfur Clean-up:

05/02/94

N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.043	7
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.052	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	Ü
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40425F

40202

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 208366

 Date Received:
 11/10/93

 Date Extracted:
 03/31/94

 Date Analyzed:
 05/02/94

 Sulfur Clean-up:
 N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	υ
309-00-2	Aldrin	0.0050	Ü
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.014	
60-57-1	Dieldrin	0.010	U.
72-54-8	4,4'-DDD	0.01.0	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

 Lab Name:
 Aquatec, Inc.
 K40426F

 Lab Code:
 AQUAI
 Contract:
 91082

 Case:
 BIO
 SDG:
 40202

 Lab Sample ID:
 208368

Client ID No.

Phase Type: **Biota Date Received:** 11/10/93 Phase Weight: 10.0 **Date Extracted:** 03/31/94 **Extraction:** Soxhlet Date Analyzed: 05/02/94 Dilution Factor: 1.0 Sulfur Clean-up: N

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	ā
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	υ
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachlor	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40429F

40202

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 214891

 Date Received:
 11/10/93

 Date Extracted:
 03/30/94

 Date Analyzed:
 05/02/94

 Sulfur Clean-up:
 N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	Ü
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	Ü
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	Ü
5103-71-9	alpha-Chlordane	0.0050	U
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.019	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	Ü
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No.
K40431F

40202

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 214893

Date Received: 11/10/93

Date Extracted: 03/30/94

Date Analyzed: 05/02/94

Sulfur Clean-up: N

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	Ü
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.0050	U
1024-57-3	Heptachlor Epoxide	0.0050	U
5103-74-2	gamma-Chlordane	0.0050	U
5103-71-9	alpha-Chlordane	0.0050	U .
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.012	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.010	U
5103-73-1	cis-Nonachlor	0.0050	U
50-29-3	4,4'-DDT	0.010	U
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

MERCURY ANALYSES

Introduction

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

One of the two CRDL standard recoveries was above acceptable limits. No associated data fell in the affected range; therefore, no qualifiers were added to the samples.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was below acceptable limits. All data have been qualified as estimated based on the deviation.

4.2 Laboratory Duplicate

The laboratory duplicate relative percent difference (RPD) was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	X		
Sample No.?	X		 -
SDG No.?	X		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	X		
is the data properly labeled?	X		
Holding Times			
Were mercury analyses performed within 28 days?	<u> </u>		·

	YES	NO	NA
Were cyanide distillations performed within 14 days?			X
Were other metal analysis performed within 6 months?			X
Form I (Final Data)			·
Are all forms complete?	X		
Are correct units indicated on Form 1's?	X		
Are all "less than IDL" values properly coded with "U"?	X		
Are the correct concentration qualifiers used with final data?	X		
Was a brief physical description of samples given on Form I's?		X	
Calibration			
Is a record of at least 2 point calibration present for ICP analysis?	·		X
ls a record of 5 point calibration present for Hg analysis?	X		
Is a record of 4 point calibration present for:			
Flame AA?			X
Furnace AA?			X
Cyanides?			X
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?			X
ls correlation coefficient less than .995 for:			
Mercury Analysis?	X		
Cyanide Analysis?			X
Atomic Absorption Analysis?			X
Form II A (Initial and Continuing Calibration Verific	ation)		
Present and complete for every metal and cyanide?	<u> </u>		
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?			X
Hg (80-120 %R)?	X		
Cyanides (85-115 %R)?			X

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			×
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			Х
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?		X	
Is mid-range standard within control limits for cyanide (80-120 %R)			×
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL <crdl) (crdls)?<="" contract="" detection="" equal="" less="" limits="" or="" required="" td="" than="" the="" to=""><td>×</td><td></td><td></td></crdl)>	×		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			×
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	x		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		×	

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			X
Is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			Х
Is concentration of prep. blank below the negative CRDL?		X	
Form IV (ICP Interference Check Sample)			
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			х
Are all Interference Check Sample results inside the control limits (±20%)?			×
If no, is concentration of AI, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
Form V A (Spiked Sample Recovery - Pre-Digestion/F	re-Distil	<u>lation)</u>	
Present and complete for:			
each SDG?	X		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?		X	
If no, is sample concentration greater than or equal to four times spike concentration?		X	
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	X		
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?	X		
between 126-200%?		X	
greater than 200%?		X	
Form VI (Lab Duplicates)		<u></u>	
Present and complete for:			
each SDG?	X		

	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		×	
Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	X		
If 'no, are all results outside the control limits flagged with an * on Form I's and VI?	•		X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?		Χ.	
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?			X
Form VII (Laboratory Control Sample)			
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
Form IX (ICP Serial Dilution)			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			Х
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E" on Form I's and Form IX when initial concentration of Form IX is equal to 50 times IDL or greater.			×
Are any % difference values:			
> 10%?			X
≥100%?			X
Furnace Atomic Absorption (AA) QC Analysis			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA?			x

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?			X
Was a dilution analyzed for sample with analytical spike recovery less than 40%?			X
Is analytical spike recovery outside the control limits (85-115%) for any sample?			X
Form VIII (Method of Standard Addition Results)			
Present?		x	
If no, is any Form I result coded with "S" or a "+"?		X	
Is coefficient of correlation for MSA less than 0.990 for any sample?			X
Was MSA required for any sample but not performed?		X	
Is coefficient of correlation for MSA less than 0.995?			X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?			X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?			X
<u>Field Blank</u>			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?			X
If no, was field blank value already rejected due to other QC criteria?			×
Form X, XI, XII (Verification of Instrumental Parameter	ers)		
Is verification report present for :			
Instrument Detection Limits (quarterly)?	X		
ICP Interelement Correlation Factors (annually)?		·	X
ICP Linear Ranges (quarterly)?			X
Form X (Instrument Detection Limits)			
Are IDLs present for:			
all the analytes?	X		
all the instruments used?	X		

	YES	NO	NA
Is IDL greater than CRDL for any analyte?		X	
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL, greater than 5 x IDL.			X
Was any sample result higher linear range of ICP.			X
Was any sample result higher than the highest calibration standard for non-ICP parameters?		X	
If yes for any of the above, was the sample diluted to obtain the result on Form I?			X

Corrected Sample Analysis Data Sheets

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

Lab Name: AQUA	TEC		Contract: 91	1082		K40360F
Lab Code: AQUA	I Ca	se No.: BI	SAS No.:	:		SDG No.: 40202
	_					
Matrix (soil/w	acer; rism	-		Lab	Sampi	e ID: 208350
Level (low/med): LOW_			Dat	e Rece	ived: 10/16/93
% Solids:	100.	0				
Co.	ncentration	Units (ug	/L or mg/kg dry	y we	ight):	MG/KG
	1	Τ	· · · · · · · · · · · · · · · · · · ·	П		-
	CAS No.	Analyte	Concentration	С	Q	М
	7429-90-5			- -		NR
	7440-36-0	Antimony_				NR
	7440-38-2	Arsenic				nr
	7440-39-3	Barium		_ _		NR
	7440-41-7	Beryllium		_ _		NR
	7440-43-9	Cadmium_ Calcium		- -		NR
	7440-70-2 7440-47-3		 ,	- -		NR
	7440-47-3	Chromium_ Cobalt		- -		NR NR
	7440-50-8	Copper		 - -		NR NR
	7439-89-6	Iron		- -		NR NR
	7439-92-1	Lead		- -		NR
-	7439-95-4	Magnesium		- -		NR
	7439-96-5	Manganese		- -		NR
	7439-97-6	Mercury	0.10	- =		CV
	7440-02-0	Nickel		- -		NR
	7440-09-7	Potassium		- -		NR
	7782-49-2	Selenium		- -		NR
	7440-22-4	Silver -		- -		NR
	7440-23-5	Sodium		- -		NR
	7440-28-0					NR
	7440-62-2	Vanadium_				NR
	7440-66-6	Zinc		_ _		NR
		Cyanide		_ _		NR
				1_1_	1	
Color Before:		Clarit	ty Before:			Texture:
Color After:		Clarit	ty After:			Artifacts:
Comments:						

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

	AQUATEC		Contract: 91	108	2	K40365F
ab Code: 1	AQUAI_ Ca	se No.: BI	O SAS No.:	:		SDG No.: 40202
Matrix (so:	- il/water): FISH	<u> </u>		La	b Sampi	le ID: 208352
Level (low)	/med): LOW			Ďa	te Rec	eived: 10/16/93
	_					
Solids:	100.	O				
	Concentration	Units (ug	/L or mg/kg dry	y w	eight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		NR
	7440-36-0	Antimony		-		NR
	7440-38-2	Arsenic_				NR
	7440-39-3	Barium				NR
		Beryllium]_].		NR
	7440-43-9 7440-70-2	Cadmium_ Calcium		l—I:		NR NR
	7440-47-3	Chromium		- -		NR NR
	7440-48-4	Cobalt		-		NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron		1-1		NR
	7439-92-1	Lead				NR
		Magnesium				NR
	7439-96-5	Manganese		-		NR
	7439-97-6 7440-02-0	Mercury_ Nickel	0.13	-	<u></u>	CV NR
	•	Potassium		 -		NR NR
	7782-49-2	Selenium		-		NR
		Silver				NR
		Sodium		-		NR
	7440-28-0	Thallium_				NR
		Vanadium_				NR
	7440-66-6	Zinc				NR
		Cyanide_		_		NR
	l		l	1_1		11
olor Befor	:e:	Clari	ty Before:		<u>-</u>	Texture:
Color After	:	Clari	ty After:			Artifacts:
Comments:						

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

Lab Name: AQUA	TEC		Contract: 91	L082 _	K40366F
					SDG No.: 40202_
Matrix (soil/w	ater): FISH	_		Lab Sample	e ID: 208354
Level (low/med): LOW_	_		Date Rece	ived: 10/16/93
% Solids:	100.	0			
			/L or mg/kg dry	weight):	MG/KG
	CAS No.	Analyte	Concentration	C Q	<u></u>
	7440-70-2 7440-47-3 7440-48-4	Antimony_ Arsenic_ Barium_ Beryllium Cadmium_ Calcium_ Chromium_ Cobalt			NR NR NR NR NR NR NR NR NR NR
	7439-92-1 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-22-4	Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver	0.12		NR NR NR CV NR NR NR NR
	7440-23-5 7440-28-0 7440-62-2 7440-66-6	Sodium Thallium Vanadium Zinc Cyanide			NR NR NR NR NR
Color Before:		Clarit	ty Before:		Texture:
Color After:		Clarit	ty After:		Artifacts:
Comments:					

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

	ATEC		Contract: 91	1082		K40367F
Lab Code: AQUI	AI_ Ca	se No.: BI	OSAS No.:	·		SDG No.: 40202_
Matrix (soil/v	water): FISH	_		Lab	Sampl	e ID: 208356
Level (low/med	d): LOW_	-		Date	e Rece	ived: 10/16/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y we	ight):	MG/KG
	CAS No.	Analyte	Concentration	C	Q	M
	7429-90-5	Aluminum		- -	——————————————————————————————————————	NR
	7440-36-0	Antimony		\- -		NR
	7440-38-2	Arsenic		- -		NR
	7440-39-3	Barium		- -		NR
	7440-41-7	Beryllium		\-\-		NR
	7440-43-9	Cadmium		- -		NR
	7440-70-2	Calcium		- -		NR
	7440-47-3	Chromium		- -		NR
		Cobalt		- -		NR
	7440-50-8	Copper		- -		NR
	7439-89-6	Iron		<u> </u>		NR
		Lead		- -		NR
		Magnesium		- -		NR
		Manganese		- -		NR
	7439-97-6	Mercury	0.09	- 5		CV
		Nickel -		- -		NR
•		Potassium		- -		NR
		Selenium		1-1-		NR
		Silver		- -		NR
		Sodium		- -		NR
		Thallium		- -		NR
		Vanadium		- -		NR
	7440-66-6	Zinc		- -		NR
		Cyanide_		- -		NR
				 _ _	I	I
Color Before:	•	Clarit	ty Before:			Texture:
Color After:		Clarit	ty After:			Artifacts:
Comments:						
	·					

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ab Name: AQUA	ATEC	·	Contract: 91	L08	32	K40368F
ab Code: AQUA	AI_ Ca	se No.: BI	SAS No.:	: _		SDG No.: 40202
atrix (soil/v	water): FISH	_		La	ab Samp	le ID: 208358
evel (low/med	l): LOW_	_		Da	te Rec	eived: 10/16/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	7 W	veight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
		1		_		100 N
	7429-90-5 7440-36-0	Aluminum_ Antimony		-1		NR NR
	7440-38-2	Arsenic		-		NR NR
		Barium		-		NR
	7440-41-7	Bervllium		-		NR
	7440-43-9	Beryllium Cadmium		-		NR
		Calcium		-		NR
	7440-47-3	Chromium		-		NR
	7440-48-4	Cobalt				NR
	7440-50-8	Copper		<u> </u>		NR
	1			_		NR
-	7439-92-1	Lead		_		NR
		Magnesium		_		NR
		Manganese		_{	-	NR
	7439-97-6	Mercury_	0.06	-	<u> </u>	CV
		Nickel Potassium		-		NR NR
		Selenium		-		NR
		Silver		-		NR
		Sodium		-		NR
	7440-28-0	Thallium		-		NR
		Vanadium		-		NR
	7440-66-6	Zinc		-		NR
		Cyanide_		-		NR
olor Before:		Clarit	ty Before:	-	! 	Texture:
					-	
olor After:		Clarit	ty After:		_	Artifacts:
omments:						

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EPA SAMPLE NO

	INORGANIC ANALYSES DATA SHEET			SHEET	EFA SAMPLE NO.	
ab Name: AQU	ATEC	K40391F				
ab Code: MIII	A.T C2	se No · BT		SDG No.: 40202		
ap code. Agoi	ca	se no bi	SAS NO.		_ SDG NO.: 40202	
atrix (soil/	water): FISH	-		Lab San	mple ID: 208360	
evel (low/med	i): LOW_	_		Date R	eceived: 10/16/93	
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y weigh	t): MG/KG	
	CAS No.	Analyte	Concentration	C Q	м	
	7429-90-5				NR	
	7440-36-0	Antimony_			NR	
	7440-38-2 7440-39-3	Arsenic		-	NR NR	
	7440-41-7			-	- NR	
	7440-43-9	Cadmium			- NR	
	7440-70-2	Calcium		-	NR	
	7440-47-3	Chromium			NR	
	7440-48-4				NR	
	7440-50-8	Copper			NR NR	
	7439-89-6 7439-92-1	Iron		-	NR NR	
	7439-95-4	Magnesium		-	- NR	
	7439-96-5	Manganese		-	- NR	
	7439-97-6	Mercury	0.06	- 2N	CV	
	7440-02-0	Nickel			NR	
•	7440-09-7	Potassium		_	NR	
	7782-49-2 7440-22-4	Selenium_			NR NR	
	7440-23-5			-	NR NR	
	7440-28-0	Thallium		-	- NR	
	7440-62-2	Vanadium_		-	NR	
	7440-66-6	Zinc			NR	
		Cyanide		-	NR	
	I	1	·	1-1	1	
olor Before:		Clari	ty Before:		Texture:	
olor After:		Clari	ty After:		Artifacts:	
omments:						

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

		INORGANIC A	Analyses data s	SHI	EET	
Lab Name: AQUA	Contract: 91082			K40424F		
Lab Code: AQUA	I_ Ca	se No.: BI	SAS No.:	: _		SDG No.: 40202_
Matrix (soil/w	ater): FISH	_		La	ab Samp	le ID: 208364
Level (low/med	_	-		Da	ate Rec	eived: 11/10/93
% Solids:	100.	0	•			
Co	ncentration	Units (ug	/L or mg/kg dry	y v	weight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5			- -		NR
	7440-36-0	Antimony_		_		NR
	7440-38-2	Arsenic		_		NR
	7440-39-3	Barium		 _		NR
	7440-41-7 7440-43-9	Beryllium Cadmium		-		NR NR
	7440-70-2	Calcium				NR
	7440-70-2	Chromium		-		NR
	7440-48-4			-		NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron		-		NR
	7439-92-1	Lead		-		NR
$\overline{}$	7439-95-4	Magnesium		-		NR
	7439-96-5	Manganese		-		NR
	7439-97-6	Mercury	0.16	-	<u>7</u> N	CV
	7440-02-0	Nickel		-		NR
	7440-09-7	Potassium	·	_		NR
	7782-49-2	Selenium		-		NR
	7440-22-4	Silver -		-		NR
	7440-23-5	Sodium		-		NR
	7440-28-0	Thallium		-		NR
	7440-62-2	Vanadium -		-		NR
	7440-66-6	Zinc		-		NR
		Cyanide		_		NR
0.1	l			I	l <u> </u>	
Color Before:		Clari	ty Before:		-	Texture:
Color After:		Clari	ty After:		<u>.</u>	Artifacts:
Comments:						

FORM I - IN

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		INORGANIC :	MALYSES DATA SHEET			DEA SAMPLE NO.	
	ATEC		Contract: 91	Contract: 91082			
		SAS No.:			SDG No.: 40202		
	_					•	
Matrix (soil/v	water): FISH			Lab Sa	ample	ID: 208366	
evel (low/med	i): LOW_	_		Date 1	Recei	ved: 11/10/93	
Solids:	100.	0					
Co	oncentration	Units (ug	/L or mg/kg dry	y weigl	ht):	MG/KG	
	CAS No.	Analyte	Concentration	C Q	м		
	7429-90-5	Aluminum			— _N	R	
	7440-36-0	Antimony_		-		R	
	7440-38-2	Arsenic		-		R	
	7440-39-3	Barium -		- -	— N	R	
	7440-41-7	Beryllium				R	
	7440-43-9					R	
	7440-70-2					R	
	7440-47-3	Chromium_		_		R	
	7440-48-4	Cobalt		_		R	
	7440-50-8	Copper				R	
	7439-89-6	Iron				R	
	7439-92-1	Lead		_		R	
	7439-95-4	Magnesium		_		R	
	7439-96-5	Manganese				R	
	7439-97-6	Mercury_	0.03	_ <u></u>		V R	
	7440-02-0 7440-09-7	Nickel Potassium		-		R	
•	7782-49-2			-		R	
	7440-22-4			-		R	
	7440-23-5			-		R	
	7440-28-0					R	
	7440-62-2	Vanadium-		-		R	
	7440-66-6	Zinc		-		R	
		Cyanide_			N	R	
color Before:		Clari	ty Before:		 T	_ exture:	
olor After:		Clari	ty After:		A	rtifacts:	
comments:							

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Name: AQUA	ATEC		Contract: 91	L082		K40426F
Lab Code: AQUA	I_ Ca	se No.: BI	SAS No.:			SDG No.: 40202
Matrix (soil/w				•		ID: 208368
Level (low/med	l): LOW_			Date :	Recei	ved: 11/10/93
% Solids:	100.	0				
			/L or mg/kg dry	y weig	ht):	MG/KG
	CAS No.	Analyte	Concentration	C Q	M	1
	7429-90-5	Aluminum				R
	7440-36-0	Antimony_				IR
	7440-38-2	Arsenic				TR
	7440-39-3	Barium Beryllium				TR TR
	7440-41-7 7440-43-9	Cadmium				IR I
	7440-70-2	Calcium				ir R
	7440-47-3	Chromium	' 			R R
	7440-48-4	Cobalt		-		R
	7440-50-8	Copper		-		R
	7439-89-6	Iron				R
		Lead				TR
\sim		Magnesium				TR .
•		Manganese				TR
		Mercury	0.08	_ <u>Zn</u>		.V
		Nickel		-	N	nr.
	7440-09-7	Potassium		-	N	IR
	7782-49-2	Selenium			N	IR
	7440-22-4	Silver -			N	IR
	7440-23-5	Sodium				IR
	7440-28-0	Thallium_				IR
	7440-62-2					IR
	7440-66-6	Zinc				IR
		Cyanide_		-	N	IR
		l		l l		l
Color Before:		Clari	ty Before:		ı	exture:
Color After:		Clari	ty After:		P	Artifacts:
Comments:						
						·.
						
						

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

					·	
	TEC		Contract: 9	1082	K40429F	
Lab Code: AQUA	AI_ Ca	se No.: BI	O SAS No.:	SAS No.:		
Matrix (soil/w	water): FISH	-		Lab Samp	ple ID: 214891	
Level (low/med	l): LOW_			Date Rec	ceived: 11/10/93	
& Solids:	100.	_ n				
, 5011us.	100.	•				
Co	ncentration	Units (ug	/L or mg/kg dry	y weight)	: MG/KG	
	1	Τ		г г	T- 1	
	CAS No.	Analyte	Concentration	C Q	M	
•					-	
	7429-90-5		·	_	NR	
•	7440-36-0	Antimony_		[_]	NR	
	7440-38-2	Arsenic			NR	
	7440-39-3	Barium		_	NR	
•	7440-41-7	Beryllium			NR	
	7440-43-9	Cadmium_		_	NR	
	7440-70-2	Calcium_		_	NR	
	7440-47-3	Chromium_		_	NR	
	7440-48-4	Cobalt		_	NR	
	7440-50-8	Copper		_	NR	
	7439-89-6	Iron	·	_	NR	
_	7439-92-1	Lead			NR	
		Magnesium		_	NR	
		Manganese			NR	
		Mercury_	0.04		[CV]	
		Nickel			NR	
•	7440-09-7	Potassium			NR	
	7782-49-2	Selenium_] NR	
		Silver			_ NR	
	7440-23-5	Sodium			NR	
	7440-28-0	Thallium_			NR	
	7440-62-2	Vanadium_			NR	
	7440-66-6	Zinc			NR	
		Cyanide_			NR	
				_	_!!	
color Before:		Clarit	ty Before:	i. 	Texture:	
olor After:	•	Clarit	ty After:		Artifacts:	
Comments:						
						

FORM I - IN

ILM02.1

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

	TEC		Contract: 9:	1082	K40431F
Lab Code: AQUA	I_ Ca	se No.: BI	SAS No.	:	SDG No.: 40202
Matrix (soil/w					le ID: 214893
Level (low/med): LOW_	_	·	Date Rece	eived: 11/10/93
% Solids:	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	y weight):	: MG/KG
	CAS No.	Analyte	Concentration	C Q	м
	7429-90-5	Aluminum			NR
	7440-36-0	Antimony_			NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium		-	NR
	7440-41-7 7440-43-9	Beryllium Cadmium		-	NR
	7440-70-2	Calcium		-	NR NR
	7440-47-3	Chromium		-	NR
	7440-48-4	Cobalt		-	NR
	7440-50-8	Copper		-	NR
	7439-89-6	Iron		-	NR
_	7439-92-1	Lead		-	NR
		Magnesium		-	NR
	7439-96-5	Manganese			NR
	7439-97-6	Mercury	0.06	_ ZN	cv
	7440-02-0	Nickel			NR
	7440-09-7	Potassium			NR
	7782-49-2	Selenium_			NR
	7440-22-4	Silver		_	NR
	7440-23-5	Sodium		-	NR
		Thallium_			NR
	7440-62-2	Vanadium_		-	NR
	7440-66-6	Zinc Cyanide		-	NR NR
		cyanitue		-	N.K.
'	·			1-1	11
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					
					

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

				% Lipids			
Sample ID	Description	Sex	Fillet Weight	Fillet	Remaining Carcass		
K40360	Carp	female	746g	12.03	17.7		
K40365	Carp	female	513g	4.09	7.1		
K40366	Carp	male	517g	5.90	5.3		
K40367	Carp	female	407g	2.21	7.7		
K40368	Carp	male	502g	3.84	7.7		
K40391	Carp	male	475g	4.32	7.3		
K40424	Carp	female	409g	3.19	5.1		
K40425	Carp	female	441g	1.44	3.9		
K40426	Carp	female	311g	1.08	2.8		
K40429	Carp	female	507g	1.30	3.1		
K40431	Carp	female	490g	1.44	5.4		

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DATA REVIEW FOR

ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

SDG# 40219

PCB, PESTICIDE AND MERCURY ANALYSES

BIOTA - FISH

Analyses performed by:

Aquatec, Inc. Colchester, Vermont

Review performed by:

Blasland, Bouck & Lee, Inc. Syracuse, New York

Summary

The following is an assessment of the Pesticide/PCB/PBB and Mercury data for SDG# 40219 for the Biota sampling of the Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site. Included with this assessment are the data review check sheets used in the review of the package and the corrected sample results. Analyses were performed on the following samples:

					Analysis		
Sample ID	Lab ID	Species	Description	Sample Location	Peet/PCB/ Hg	%Lipid	
K40114W	198335	Sucker	whole body	Mosel Ave.	х	×	
K40115W*	196336	Sucker	whole body	Mosel Ave.	x	x	
K40116W	196337	Sucker	whole body	Mosel Ave.	x	×	
K40117W	196338	Sucker	whole body	Mosel Ave.	x	×	
K40381W	201638	Sucker	whole body	Plainwell Dam	×	x	
K40382W	201639	Sucker	whole body	Plainwell Dam	х	x	
K40383W	201640	Sucker	whole body	Plainwell Dam	x	×	
K40384W	201641	Sucker	whole body	Plainwell Dam	×	x	
K40385W	201642	Sucker	whole body	Plainwell Dam	x	×	
K40386W	201643	Sucker	whole body	Plainwell Dam	×	x	
K40392W	201644	Sucker	whole body	Mosel Ave.	×	×	
K40393W	201645	Sucker	whole body	Mosel Ave.	×	×	
K40394W	201646	Sucker	whole body	Mosel Ave.	×	x	
K40395W	201647	Sucker	whole body	Mosel Ave.	×	x	
K40396W	201648	Sucker	whole body	Mosel Ave.	×	х	
K40397W	201649	Sucker	whole body	Mosel Ave.	×	x	
K40398W	201650	Sucker	whole body	Mosel Ave.	×	х	

MS/MSD/DUP performed on sample

PCB ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 method 8081, modified for PCB only analysis.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

The data presented in the package has been derived using a procedure developed by Aquatec, Inc. in an attempt to improve the analytical process of calibration, identification, and quantitation of PCBs as Aroclors. Key components of this procedure include:

Calibration

The response function of the electron capture detector is inherently non-linear, and while significant linearization is achieved for this detector by electronic means, some non-linearity remains. Power function linearization is used to "straighten the curve" and allow the use of response factors for calibration purposes.

During the initial calibration a response factor is calculated for each peak in the individual Aroclors.

A weighted response factor calculation has been used to adjust for non-linearity at the low end of the calibration curve.

Identification

Peak retention times are relative. Retention times are in set windows relative to the time markers DCB and TCMX. Time markers adjust for minor variations in column flow or instrument condition and allow the use of very tight windows which minimizes the number of both false positive and false negative peak identifications.

The determination of "which Aroclor or mixture of Aroclors will produce a chromatogram most similar to that of the residue" is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The "most similar" Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors. This is similar to the procedure presented by L.E. Slivon, P.M. Schumacher and A. Alford-Stevens for the determination of Aroclor composition from GC/MS level of chlorination results.

Identification/quantitation of Aroclors in samples is based on the combined response of two columns, typically RTX-5 and RTX-35. The pooling of response combines the unique qualities of both columns to derive a more defined Aroclor pattern which less likely to be affected by interferents. Identification/quantitation data for the individual columns is provided in the package and can be used as a check on the combined column results.

Data Assessment

1. Holding Time

The specified holding time for PCB analyses from extraction is 40 days. All samples were analyzed within the specified holding time.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No Aroclors were detected in the method or instrument blanks.

3. System Performance

The system performance was acceptable for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

The method allows a maximum RSD of 20%. The %RSD was within acceptable limits for all Aroclors.

4.2 Continuing Calibration

A maximum %D of 15 is allowed. All continuing calibrations were within the specified limits.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recoveries were below acceptable control limits for one surrogate in samples K40114W and K40115WMSD. No qualifiers were added to the data based on the deviations. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The determination of Aroclor presence is made by expressing the unknown sample chromatogram as a linear combination of the Aroclors. The most similar Aroclor or mixture of Aroclors is determined by using a least squares minimization of the difference between the unknown chromatogram and the linear combination of Aroclors.

Identification/quantitation of Aroclors is based on the combined response of the RTX-5 and RTX-35 columns. Identification/quantitation data for the individual columns is provided in the package and has been used as a check on the combined column results.

A review of the sample chromatograms indicate that the Aroclors have been correctly identified/quantitated.

7. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

All matrix spike and matrix spike duplicate recoveries and the relative percent difference between recoveries (RPD) were within acceptable control limits. All spike recoveries in the matrix spike blank were within acceptable control limits.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

DATA REVIEW CHECKLIST

PCB Data Review Checklist

	YES	NO	NA_
Data Completeness and Deliverables			
is there a narrative or cover letter present?	<u>X</u>	·	
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		<u>x</u>	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?	<u>.</u>		
0 out of4			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
0_ out of2			
Blanks			
Is a Method Blank Summary Form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	x		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	x		

PCB Data Review Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	x		
Do any method/reagent/instrument blanks have positive results?		X	
Do any field/rinse blanks have positive results?			X
Are there field/rinse/equipment blanks associated with every sample?		X	
Calibration and GC Performance			
Are the following chromatograms and data printouts present?			
Arocior 1016/1260	<u> </u>		
Aroclor 1221	<u> </u>		
Aroclor 1232	<u>x</u>		
Aroclor 1242	<u> </u>		
Aroclor 1248	X		
Arocior 1254	X		
Instrument Blanks	X		
Are Initial Calibration Summary Forms present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses within limits for both columns (20% RSD)	X		
Have all samples been injected within a 12 hour period beginning with the injection of an instrument blank?	x		
Is a Calibration Verification Summary Form present and complete for each continuing standard analyzed?	×		
Are %D values for all compounds within limits (less than 15%)?	×		
Analytical Sequence Check			
is a analytical sequence form present and complete for each column and each period of analyses?	x		
Was the proper analytical sequence followed?	<u> </u>		

PCB Data Review Checklist - Page 3

	YES	NO	NA
Cleanup Efficiency Verification			
If GPC cleanup was performed, is Gel Permeation Chromatography Check Form present?	X		
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits?	X		
PCB Identification			
ls both a combined and single column Aroclor Identification Report present for every sample?	<u>x</u>		
Do the combined column and individual column Aroclor identifications agree?	x		
Were there any false negatives?		X	
Was GC/MS confirmation provided when required?			×
Compound Quantitation and Reported Detection Lin	nits		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	X _.		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	
Field Duplicates			
Where field duplicates submitted with the samples?		X	

PCB Holding Time and Surrogate Recovery Summary

Sample ID	Holding	Surrogates	- Column 1	Surrogates	- Column 2
	Time	TCX	DCB	TCX	DCB
K40114W	OK for all	↓ (55)	ОК	↓ (57)	ОК
K40115W	samples -				
K40115WMS					
K40225WMSD		Į (54)	•		
K40116W					
K40117W					
K40381W					
K40382W					
K40383W					
K40384W					
K40385W					
K40386W					
K40392W					
K40393W					
K40394W					
K40395W					
K40396W					
K40397W					
K40398W					

Surrogate Standards TCX Tetrachioro-m-xylene DCB Decachlorobiphenyl Qualifiers:

D Surrogates diluted out

Recovery high Recovery low t

Unless otherwise noted, all parameters are within specified limits.

PCB Calibration Summary

Instrument: HP2087 Column: RTX-35 / RTX-5

Date:	5/8/94 2109	5/10	5/10	5/10	5/10	5/11	5/11
Time:	to 5/9/94 1730	1244	1320	2117	2158	0504	0540
•	initial Cal.	Gont. Cal.	Cont. Cali	Cont. Cal.	Cont. Cel.	Cont. Cal.	Cont. Cal.
	% RSD	% D	XD	%D	% D	% D	% D
Aroclor 1016	5.0 / 4.7		1.0				
Aroclor 1221	3.8 / 2.8						
Aroclor 1232	3.0 / 2.7	<u> </u>					
Aroclor 1242	3.7 / 2.9				8.0		
Aroclor 1248	3.6 / 3.1	5.0		6.0		7.5	
Aroclor 1254	9.3 / 8.9						13.0
Aroclor 1260	3.0 / 3.0						
Tetrachioro-m-xylene	4.9 / 5.2						
Decachiorobiphenyl	8.1 / 8.4						
Affected Samples:							ļ
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PCB Calibration Summary - Page 2

Instrument: <u>HP6087</u> Column: <u>RTX-35 / RTX-5</u>

				3			
Date:		5/11	5/11				
Time:		1027	1103				
	initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Call.	Cont. Cal.	Cent. Gel.
,	% RSD	%D	%D	% D	*0	%D	% D
Aroclor 1016							
Aroclor 1221							
Aroclor 1232				<u> </u>			
Aroclor 1242							
Aroclor 1248		7.5					
Aroclor 1254							
Arocior 1260			6.0				
Tetrachloro-m-xylene						<u></u>	
Decachlorobiphenyl							
Affected Samples:							
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		:					<u> </u>
							
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CORRECTED ANALYSIS SUMMARY FORMS

EPA SAMPLE NO. K40114W Lab Code: Lab Name: Aquatec, Inc. AQUAI SDG: 40219 91082 Contract: Case: BIO **BIOTA** Phase Type: Lab Sample ID: 196335 10.0 Date Received: Phase Weight: (g) 09/03/93 Injection Volume: 1.0 (uL) Date Extracted: 04/13/94 5.0 Date Analyzed: 05/11/94 Dilution Factor: Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	1.1	
12672-29-6	Aroclor-1248	0.25	υ
11097-69-1	Aroclor-1254	1.7	
11096-82-5	Aroclor-1260	0.25	U

EPA SAMPLE NO. K40115W Lab Name: Aquatec, Inc. Lab Code: AQUAI 91082 BIO SDG: 40219 Contract: Case: Phase Type: **BIOTA** Lab Sample ID: 196336 09/03/93 10.0 Date Received: Phase Weight: (g) 1.0 Date Extracted: 04/13/94 (uL) Injection Volume: 5.0 Date Analyzed: 05/11/94 Dilution Factor: Sulfur Clean-up: N (Y/N)

COMPOUND	CONCENTRATION (mg/Kg)	Q
Aroclor-1016	0.64	
Aroclor-1221	0.25	U
Aroclor-1232	0.25	U
Arocior-1242	0.25	U
Aroclor-1248	0.25	U
Aroclor-1254	2.0	
Aroclor-1260	. 0.24	J
	Aroclor-1016 Aroclor-1221 Aroclor-1232 Aroclor-1242 Aroclor-1248 Aroclor-1254	Aroclor-1016 0.64 Aroclor-1221 0.25 Aroclor-1232 0.25 Aroclor-1242 0.25 Aroclor-1248 0.25 Aroclor-1254 2.0

Lab Code: _

Case: _

AQUAI

BIO

EPA SAMPLE NO.

K40116W

SDG: 40219

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 5.0

91082

Lab Name: Aquatec, Inc.

Contract:

 Lab Sample ID:
 196337

 Date Received:
 09/03/93

 Date Extracted:
 04/13/94

 Date Analyzed:
 05/11/94

Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.17	J
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Arocior-1248	0.80	
11097-69-1	Aroclor-1254	0.86	
11096-82-5	Arocior-1260	0.16	J

EPA SAMPLE NO. K40117W Lab Name: Aquatec, Inc. Lab Code: IAUDA 91082 BIO SDG: 40219 Contract: Case: **BIOTA** Lab Sample ID: 196338 Phase Type: 10.0 Date Received: 09/03/93 Phase Weight: **(g)** Date Extracted: 04/13/94 1.0 (uL) Injection Volume: _ Date Analyzed: 05/11/94 5.0 Dilution Factor: _ Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.74	
12672-29-6	Aroclor-1248	0.25	υ
11097-69-1	Arocior-1254	1.3	
11096-82-5	Aroclor-1260	0.16	J

EPA SAMPLE NO. K40381W Lab Code: Lab Name: Aquatec, Inc. AQUAI 91082 Case: BIO SDG: 40219 Contract: **BIOTA** Phase Type: Lab Sample ID: 201638 10.0 Date Received: 10/16/93 Phase Weight: (g) Injection Volume: 1.0 (uL) Date Extracted: 04/13/94 Dilution Factor: 5.0 Date Analyzed: 05/10/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.62	
11104-28-2	Arocior-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.11	J

EPA SAMPLE NO. K40382W Aquatec, Inc. Lab Code: **AQUAI** Lab Name: 91082 Case: BIO SDG: 40219 Contract: Phase Type: **BIOTA** Lab Sample ID: 201639 10.0 10/16/93 Date Received: Phase Weight: _ (g) . Injection Volume: (uL) Date Extracted: 04/13/94 1.0 Dilution Factor: 1.0 Date Analyzed: 05/10/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
12674-11-2	Aroclor-1016	0.050	U
11104-28-2	Aroclor-1221	0.050	U
11141-16-5	Aroclor-1232	0.050	U
53469-21-9	Aroclor-1242	0.050	U
12672-29-6	Aroclor-1248	0.50	
11097-69-1	Aroclor-1254	0.46	
11096-82-5	Aroclor-1260	0.085	·

EPA SAMPLE NO. K40383W Lab Code: **AQUAI** Lab Name: Aquatec, Inc. 91082 Case: _ BIO SDG: 40219 Contract: **BIOTA** Lab Sample ID: 201640 Phase Type: _ Phase Weight: 10.0 (g) Date Received: 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 04/13/94 Dilution Factor: _ 5.0 Date Analyzed: 05/10/94 Sulfur Clean-up: Υ (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.4	
11097-69-1	Aroclor-1254	1.2	
11096-82-5	Aroclor-1260	0.21	J

EPA SAMPLE NO. K40384W Lab Name: Aquatec, Inc. Lab Code: IAUDA Case: Contract: 91082 BIO SDG: 40219 **BIOTA** Lab Sample ID: 201641 Phase Type: Phase Weight: 10.0 **(g) Date Received:** 10/16/93 Injection Volume: __ 1.0 (uL) Date Extracted: 04/13/94 2.0 Date Analyzed: Dilution Factor: 05/10/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.3	
11097-69-1	Aroclor-1254	0.87	
11096-82-5	Aroclor-1260	0.18	

Lab Code:

Case:

AQUAI

BIO

EPA SAMPLE NO.

K40385W

SDG: 40219

Phase Type: BIOTA

Phase Weight: 10.0 (g)

Injection Volume: 1.0 (uL)

Dilution Factor: 2.0

Lab Name: Aquatec, Inc.

Contract:

91082

 Lab Sample ID:
 201642

 Date Received:
 10/16/93

 Date Extracted:
 04/13/94

 Date Analyzed:
 05/10/94

Sulfur Clean-up: Y (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	0
12674-11-2	Arocior-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.94	
11097-69-1	Arocior-1254	0.94	
11096-82-5	Aroclor-1260	0.15	

EPA SAMPLE NO. K40386W Lab Name: _ Aquatec, Inc. Lab Code: AQUAI SDG:_ 91082 BIO 40219 Contract: Case: **BIOTA** Lab Sample ID: 201643 Phase Type: Phase Weight: 10.0 (g) Date Received: 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 04/13/94 Dilution Factor: _ 5.0 Date Analyzed: 05/10/94 Sulfur Clean-up: N (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.25	U
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Aroclor-1254	0.77	
11096-82-5	Aroclor-1260	0.15	J

EPA SAMPLE NO. K40392W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** Contract: 91082 BIO SDG: 40219 Case: **BIOTA** Phase Type: Lab Sample ID: 201644 10.0 Phase Weight: Date Received: 10/16/93 **(g)** Injection Volume: 1.0 (uL) Date Extracted: 04/13/94 5.0 Dilution Factor: Date Analyzed: 05/10/94 Sulfur Clean-up: Ν (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Aroclor-1242	0.75	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1 Aroclor-1254	1.4		
11096-82-5	Aroclor-1260	0.18	J

EPA SAMPLE NO. K40393W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 40219 91082 BIO SDG: , Contract: Case: Phase Type: **BIOTA** Lab Sample ID: 201645 Phase Weight: 10.0 10/16/93 (0) **Date Received:** 1.0 Injection Volume: (uL) **Date Extracted:** 04/13/94 05/10/94 Dilution Factor: 5.0 Date Analyzed: Y Sulfur Clean-up: (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	Į
11104-28-2	Arocior-1221	0.25	- (
11141-16-5	Aroclor-1232	0.25	- (
53469-21-9	Aroclor-1242	0.71	
12672-29-6	Aroclor-1248	0.25	(
11097-69-1	Aroclor-1254	1.5	
11096-82-5	Aroclor-1260	0.18	,

EPA SAMPLE NO. K40394W Lab Code: AQUAI Lab Name: Aquatec, Inc. 91082 BIO 40219 Case: SDG: Contract: **BIOTA** Lab Sample ID: 201646 Phase Type: 10.0 Phase Weight: **(g) Date Received:** 10/16/93 1.0 Date Extracted: 04/13/94 Injection Volume: (uL) 5.0 Dilution Factor: Date Analyzed: 05/10/94 Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Arocior-1242	0.48	
12672-29-6	Arocior-1248	0.25	U
11097-69-1	Aroclor-1254	1.0	
11096-82-5	Aroclor-1260	0.11	J

EPA SAMPLE NO. K40395W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 BIO SDG: Contract: Case: 40219 Phase Type: **BIOTA** Lab Sample ID: 201647 10.0 Phase Weight: Date Received: 10/16/93 (g) Injection Volume: (uL) Date Extracted: 1.0 04/13/94 Dilution Factor: 5.0 Date Analyzed: 05/11/94 Sulfur Clean-up: _ N (Y/N)

CAS NO.	D. COMPOUND CONCENTRA (mg/Kg			
12674-11-2	Aroclor-1016	0.25	υ	
11104-28-2	Aroclor-1221	0.25	U	
11141-16-5	Aroclor-1232	0.25	U	
53469-21-9	Arocior-1242	0.65		
12672-29-6	Aroclor-1248	0.25	U	
11097-69-1	Aroclor-1254	1.5		
11096-82-5	Aroclor-1260	0.21	J	

EPA SAMPLE NO. K40396W Lab Name: Aquatec, inc. Lab Code: **AQUAI** SDG: 91082 Case: BIO 40219 Contract: Lab Sample ID: **BIOTA** 201648 Phase Type: 10.0 Phase Weight: **(g) Date Received:** 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 04/13/94 5.0 05/11/94 Dilution Factor: _ Date Analyzed: (Y/N) Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.25	U
11104-28-2	Aroclor-1221	0.25	U
11141-16-5	Aroclor-1232	0.25	U
53469-21-9	Arocior-1242	0.71	
12672-29-6	Aroclor-1248	0.25	U
11097-69-1	Aroclor-1254	1.5	_
11096-82-5	Aroclor-1260	0.15	J

EPA SAMPLE NO. K40397W Lab Name: Aquatec, Inc. Lab Code: **AQUAI** 91082 BIO SDG: 40219 Contract: Case: Phase Type: **BIOTA** Lab Sample ID: 201649 10.0 Phase Weight: (g) **Date Received:** 10/16/93 Injection Volume: 1.0 (uL) Date Extracted: 04/13/94 Dilution Factor: 2.0 Date Analyzed: 05/11/94 Sulfur Clean-up: Y (Y/N)

CAS NO. COMPOUND		CONCENTRATION (mg/Kg)	
12674-11-2	Aroclor-1016	0.38	
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	0.10	U
11097-69-1	Aroclor-1254	0.97	
11096-82-5	Aroclor-1260	0.11	

EPA SAMPLE NO. K40398W Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO SDG: 40219 Phase Type: **BIOTA** 201650 Lab Sample ID: 10.0 Phase Weight: **(g)** Date Received: 10/16/93 Injection Volume: 1.0 (uL) 04/13/94 Date Extracted: 2.0 05/11/94 **Dilution Factor:** Date Analyzed: Sulfur Clean-up: (Y/N)

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	<u> </u>
12674-11-2	Aroclor-1016	0.10	U
11104-28-2	Aroclor-1221	0.10	U
11141-16-5	Aroclor-1232	0.10	U
53469-21-9	Aroclor-1242	0.10	U
12672-29-6	Aroclor-1248	1.2	
11097-69-1	Aroclor-1254	1.3	
11096-82-5	Aroclor-1260	0.21	

PESTICIDE ANALYSES

Introduction

Analyses were performed according to the USEPA SW-846 Method 8081.

The data review process is intended to evaluate the data on a technical basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- C Identification confirmed by GC/MS.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The holding time for pesticide extracts is 40 days from extraction to analysis. No deviations from this holding time were noted.

2. Blank Contamination

Quality assurance blanks, i.e., method and instrument blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Method blanks measure laboratory contamination during preparation. Instrument blanks measure instrument contamination and sample cross-contamination.

No target compounds were detected in either the method blanks or instrument blanks.

3. System Performance

The resolution and compound breakdown was within acceptable limits for both columns.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

4.1 Initial Calibration

A maximum RSD of 20% is allowed. All initial calibrations were within the specified limit.

4.2 Continuing Calibration

A maximum RPD of 25% is allowed. All continuing calibrations were within the specified limit with the following exceptions:

Instrument HP2404 - RTX-5 5/14/94 00:50

2-Bromobiphenyl

30.6%

The data for this compound in the associated samples K40394W, K40395W and K40396W were qualified as estimated due to the deviation.

Instrument HP2404 - RTX-5 5/20/94 01:18

2-Bromobiphenyl

55.4%

The data for this compound in the associated samples K40397W and K40398W were qualified as estimated due to the deviation.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Recovery was above the acceptable control limit for one surrogate in sample K40116W. No qualifiers were added to this sample based on surrogate performance. All other surrogate recoveries were within acceptable control limits.

6. Compound Identification

The retention times of pesticide/PCB compounds must fall within the calculated retention time windows for both the primary and confirmation columns.

The quantitated concentrations between the two columns exceeded the 25% difference limit for the following samples and compounds:

K40114W	Aldrin Heptachlor Epoxide gamma-Chlordane alpha-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	34.0% 136.6% 127.3% 28.6% 28.7% 47.6% 547.4%
K40115W	Aldrin Heptachlor Epoxide gamma-Chlordane cis-Nonachlor 4,4'-DDT	51.4% 88.9% 122.9% 32.1% 545.8%
K40116W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	38.0% 60.4% 133.3% 30.5% 566.7%

1

K40117W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	35.3% 160.5% 126.3% 53.5% 646.2%
K40381W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	35.3% 160.5% 126.3% 53.5% 646.2%
K40382W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE	42.9% 2381.0% 207.7% 33.3%
K40383W	Aldrin Heptachlor Epoxide gamma-Chlordane alpha-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	32.7% 807.1% 150.0% 30.0% 44.2% 41.2% 586.7%
K40384W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	30.2% 115.2% 150.0% 51.4% 28.6% 636.4%
K40385W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	34.6% 686.4% 135.0% 45.6% 618.8%
K40386W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE 4,4'-DDT	28.6% 83.3% *135.7% 58.8% 640.0%
K40392W	Aldrin Heptachlor Epoxide gamma-Chlordane 4,4'-DDE cis-Nonachlor 4,4'-DDT	43.2% 100.0% 160.0% 30.0% 31.6% 562.5%

12.4.000.0W	A1	00.60
K40393W	Aldrin	28.6%
	Heptachlor Epoxide	987.1%
	gamma-Chlordane	250.0%
	alpha-Chlordane	60.0%
	4,4'-DDE	33.8%
	4,4'-DDT	611.8%
K40394W	Aldrin	46.4%
	Heptachlor Epoxide	2263.6%
	gamma-Chlordane	141.7%
	4,4'-DDE	31.5%
	cis-Nonachlor	35.7%
	4,4'-DDT	608.3%
K40395W	Aldrin	40.5%
	Heptachlor Epoxide	122.6%
	gamma-Chlordane	166.7%
	4,4'-DDE	29.3%
	4,4'-DDT	576.5%
K40396W	Aldrin	44.0%
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Heptachlor Epoxide	104.4%
	gamma-Chlordane	136.4%
	4,4'-DDE	36.4%
	4,4'-DDT	595.5%
K40397W	Aldrin	48.0%
114000717	gamma-Chiordane	150.0%
	trans-Nonachlor	233.3%
•	4,4'-DDE	37.2%
	4,4'-DDT	630.0%
K40398W	Aldrin	37.5%
1,7000011	gamma-Chlordane	131.3%
	trans-Nonachlor	235.7%
	4,4'-DDE	40.7%
	cis-Nonachlor	41.2%
	4,4'-DDT	621.4%
	.,. 551	J=/0

All data in the samples for the compounds listed has been qualified. Data with %D values between 25 and 50% has been qualified as estimated, J. All data with %D values between 50 and 90% has been qualified as estimated with presumptive evidence of presence, JN. All data with %D values greater than 90% has been rejected.

7. Matrix Spike/Matrix Spike Duplicate

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Recoveries for Aldrin and Dieldrin were above the acceptable control limit in both the matrix spike and matrix spike duplicate samples. The elevated recoveries were most likely due to positive interference from PCBs present in the samples. The blank spike associated with the MS/MSD had acceptable recoveries for all compounds. No qualifiers were added to the samples based on matrix spike performance.

8. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Pesticide Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
is there a narrative or cover letter present?	X		
Are the samples numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are the surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	x		
Are the outliers correctly marked with an asterisk?	X		
Were recoveries of TCMX or DCB outside of specified limits for any sample or blank?	x		
If yes, were the samples reanalyzed?		X	
Were the method blanks reanalyzed?			X
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
4 out of8			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
Blanks			
is the method blank summary form present?	<u> </u>		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		
Has an instrument blank been analyzed at the beginning of each 12 hour period following the initial calibration?	X		

Pesticide/PCB Data Validation Checklist - Page 2

	YES	NO	NA
Is the chromatographic performance acceptable for each instrument?	<u> </u>		
Do any method/reagent/instrument blanks have positive results?		×	
Do any trip/field/rinse blanks have positive results?			x
Are there field/rinse/equipment blanks associated with every sample?		×	
Calibration and GC Performance			
Are the following chromatograms and data printouts pre blanks, and MS/MSD?	sent for a	all samples	•
peak resolution check	<u> </u>		
performance evaluation mixtures (BCS)	X		
Toxaphene multipoint calibration	X		
Pesticide/PBB multipoint calibration			
Pesticide/PBB mid-point standard	X		
instrument blanks	X		
Are Forms VI 1-4 present and complete for each column and analytical sequence?	X		
Are the linearity criteria for the initial analyses if INDA and INDB within limits for both columns?	X		
Is the resolution between any two adjacent peaks in the resolution check mixture > 60% for both columns?	X		
Is Form VII-1 present for each BCS analyzed for both columns?	X		
Has the individual % breakdown exceeded 20% on either column for 4,4'-DDT		X	
Are all the relative percent difference (RPD) values for all PEM analytes < 25%?		x	
Is Form VII-2 present and complete for each mid-point standard analyzed?	X		
Are RPD values for all compounds < 25%?		X	
Analytical Sequence Check			
Is Form VIII present and complete for each column and each period of analyses?	x		

Pesticide/PCB Data Validation Checklist - Page 3

	YES	NO	NA
Was the proper analytical sequence followed?	<u> </u>		
Cleanup Efficiency Verification			
Is Form IX-1 present for each lot of Florisil cartridges used?	x		
Are all samples listed on the form?	X		
If GPC cleanup was performed, is Form IX-2 present?			X
Are percent recoveries of the compounds used to check the efficiency of the cleanup procedure within QC limits for:			
Florisil cartridge check (80-120%)	X		
GPC calibration (80-110%)			X
Pesticide/PBB identification			
Is a Form X present for every sample in which a pesticide or PCB was detected?	<u> </u>		
Was GC/MS confirmation provided when required?			X
Is the percent difference (%D) calculated for the positive sample results on the two columns less than 25%?		X	
Were there any false negatives?		X	
Compound Quantitation and Reported Detection Limit	8		
Are the reporting limits adjusted to reflect sample dilutions, and for soils, sample moisture?	x		
Chromatogram Quality			
Were the baselines stable?	<u> </u>		
Were any electronegative displacement (negative peaks) or unusual peaks detected?		X	حواصدونين
Field Duplicates			
Where field duplicates submitted with the samples?		<u> </u>	

Pesticide/PBB Qualifier Summary Holding Time and Surrogates

Sample ID	Holding	Holding Surrogates - Co		Surrogates - Column 2		
	Time	TCX	DCB	TCX	DCB	
K40114W	OK for all	ОК		ок		
K40115W	samples					
K40115WMS						
K40115WMSD					•	
K40116W			† (154)		† (152)	
K40117W						
K40381W						
K40382W						
K40383W						
K40384W						
K40385W						
K40386W						
K40392W						
K40393W						
K40394W						
K40395W						
K40396W						
K40397W						
K40398W						

Surrogates:

TCX Tetrachloro-m-xylene DCB Decachlorobiphenyl

Qualifiers:

D Surrogate diluted out

Recovery high

Recovery low

Unless otherwise noted, all samples are within specified limits.

Pesticide/PBB Calibration Summary

Instrument: <u>HP2404</u> Column: <u>RTX-5</u>

Date:	5/12/94	5/13	5/13	5/14		
Time:	17:54	08:10	16:30	00:50		
	initial	Cont.	Cont.	Cont.	Cont.	Cont.
٠	Cal.	Cal. %D	Cal.	Cal.	Gal. %D	Cal.
2-Bromobiphenyl	%RSD ok	ok	ok	30.2		<u>%0</u>
3-Bromobiphenyl			<u></u>			
4-Bromobiphenyl						
Hexachlorobenzene				1		
gamma-BHC (Lindane)						
Aldrin						
Heptacior epoxide						
gamma-Chlordane						
alpha-Chiordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene						
Decachiorobiphenyl						
Affected Samples:				K40394W		
[K40395W		
				K40396W		

Pesticide/PBB Calibration Summary - Page 2

Instrument: <u>HP2404</u> Column: <u>RTX-35</u>

Date:	5/12/94	5/13	5/13	5/14		
Time:	17:54	08:10	16:30	00:50		
	Initial	Cont.	Cont.	Cont.	Cont.	Cont.
	Cai,	Cal	Cal.	Cat.	Cal.	Cal.
	%RSD	%D	% D	XD	%D	% D
2-Bromobiphenyl	ok	ok	<u>ok</u>	ok		
3-Bromobiphenyl				ļ		
4-Bromobiphenyl					-	
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptacior epoxide						
gamma-Chlordane						
alpha-Chlordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachloro-m-xylene				€		
Decachlorobiphenyl						
Affected Samples:						
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[<u> </u>	
T			 			

Pesticide/PBB Calibration Summary - Page 3

Instrument: <u>HP2404</u>
Column: <u>RTX-5</u>

Date:	5/17/94	5/19	5/20			
Time:	17:19	16:57	01:18			
1	Initial Cal	Cont. Cal.	Cont. Cal.	Cont. Cel.	Coni. Cali	Cont. Cal
	%RSD	% D	% D	% D	% D	% D
2-Bromobiphenyl	ok	ok	55.4			
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)						
Aldrin						
Heptaclor epoxide						
gamma-Chlordane						
aipha-Chiordane						
trans-Nonachlor						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachior						
4,4'-DDT						
Hexabromobiphenyl (BP-6)						
Toxaphene						
Tetrachioro-m-xylene				<u> </u>		
.Decachlorobiphenyl						
Affected Samples:			K40397W			
			K40398W			
[
Γ						

Pesticide/PBB Calibration Summary - Page 4

Instrument: <u>HP2404</u> Column: <u>RTX-35</u>

Date:	5/17/94	5/19	5/20			
Time:	17:19	16:57	.01:18			
١	Initial Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.	Cont. Cal.
	*ASD	%D	% D	% D	% D	% 0
2-Bromobiphenyl	ok	ok	ok		·	
3-Bromobiphenyl						
4-Bromobiphenyl						
Hexachlorobenzene						
gamma-BHC (Lindane)	·					
Aldrin						
Heptacior epoxide						
gamma-Chlordane		-				
alpha-Chlordane						
trans-Nonachior						
4,4'-DDE						
Dieldrin						
4,4'-DDD						
cis-Nonachlor						
4,4'-DDT						_
Hexabromobiphenyl (BP-6)					ľ	
Toxaphene						
Tetrachloro-m-xylene				<u>. </u>		
Decachlorobiphenyl						
Affected Samples:				<u> </u>		
Ţ						

Corrected Sample Analysis Data Sheets

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40114W

40219

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 196335

Date Received: 09/03/93

Date Extracted: 04/13/94

Date Analyzed: 05/13/94

Sulfur Clean-up: NO

SDG:_

					_
	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
	2052-07-5	2-Bromobiphenyl	0.010	U	
	2113-57-7	3-Bromobiphenyl	0.010	U	1
	92-66-0	4-Bromobiphenyl	0.010	U	
	118-74-1	Hexachlorobenzene	0.0050	U	
	58-89-9	gamma-BHC	0.0050	U	f
	309-00-2	Aldrin	0.050	7	
	1024-57-3	Heptachler Epoxide	0.041		R
\sqsubseteq	5103-74-2	gamma-Chlordane-	0.022		R
	5103-71-9	alpha-Chlordane	0.021	7	
	39765-80-5	trans-Nonachlor	0.0050	U	
	72-55-9	4,4'-DDE	0.087	C	ŀ
	60-57-1	Dieldrin	0.010	U	
	72-54-8	4,4'-DDD	0.039		
	5103-73-1	cis-Nonachlor	0.021	J	
	50-29-3	4,4'-DDT	0.019		R
	36355-01-8	Hexabromobiphenyl	0.020	U	``
	8001-35-2	Toxaphene	0.20	U	
					,

Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 Case: BIO

Client ID No. K40115W

40219

Phase Type: Biota Phase Weight: 10.0 Soxhiet Extraction: Dilution Factor: 1.0

Lab Sample ID: 196336 Date Received: 09/03/93 **Date Extracted:** 04/13/94 05/13/94 Date Analyzed: Sulfur Clean-up: NO

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	1
2113-57-7	3-Bromobiphenyl	0.010	U	1
92-66-0	4-Bromobiphenyl	0.010	U	1
118-74-1	Hexachlorobenzene	0.0050	U	[
58-89-9	gamma-BHC	0.0050	υ	1
309-00-2	Aldrin	0.037	JN	
1024-57-3	Heptachlor Epoxide	0.045	VC	
5103 74-2	gemme-Chlordene	0.022		R
5103-71-9	alpha-Chlordane	0.019		ļ' `
39765-80-5	trans-Nonachior	0.0050	U	
72-55-9	4,4'-DDE	0.11]
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.035		
5103-73-1	cis-Nonachlor	0.028	エ]
50-29-3	4,4'-DDT	0.024]R
36355-01-8	Hexabromobiphenyl	0.020	U] `
8001-35-2	Toxaphene	0.20	U	}

Client ID No. K40116W Lab Name: Aquatec, Inc. Lab Code: AQUAI Contract: 91082 40219 Case: BIO SDG: Lab Sample ID: 196337 Phase Type: **Date Received:** 09/03/93 **Biota** Phase Weight: 04/13/94 10.0 **Date Extracted:** Extraction: Soxhlet Date Analyzed: 05/13/94 NO Dilution Factor: 1.0 Sulfur Clean-up:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	Ü	
92-66-0	4-Bromobiphenyl	0.010	Ü	
118-74-1	Hexachlorobenzene	0.0050	Ū	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.050	Ч	
1024-57-3	Heptachlor Epoxide	0.048	M	
5103-74-2	gamma-Chlordane-	0.021		ŀR
5103-71-9	alpha-Chlordane	0.016		
39765-80-5	trans-Nonachior	0.0050	U	
72-55-9	4,4'-DDE	0.082	4	
60-57-1	Dieldrin	0.010	Ü	
72-54-8	4,4'-DDD	0.027		
5103-73-1	cis-Nonachlor	0.022		
50-29-3	4,4' DDT	0.018		R
36355-01-8	Hexabromobiphenyl	0.020	U	•
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

1.0

K40117W

196338

Client ID No.

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet

Dilution Factor:

SDG: 40219

Date Received: 09/03/93

Date Extracted: 04/13/94

Date Analyzed: 05/13/94

Sulfur Clean-up: NO

Lab Sample ID:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.041	JN
1024 57 3	Heptachlor Epoxide	0.024	
5103-74-2	gamma-Chlordane	0.020	
5103-71-9	alpha-Chiordane	0.010	JN
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.077	
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.020	
5103-73-1	cis-Nonachlor	0.021	
50 20 3	4,4' DDT	0.017	
36355-01-8	Hexabromobiphenyl	0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc. Lab Code: IAUDA Contract: 91082 BIO Case:

Client ID No. K40381W

SDG: 40219

Phase Type: Biota Phase Weight: 10.0 Extraction: Soxhlet Dilution Factor: 1.0

Lab Sample ID: 201638 Date Received: 10/16/94 Date Extracted: 04/13/94 Date Analyzed: 05/13/94 Sulfur Clean-up: NO

Q	
U	1
U	1
U	1
U	1
U	1
J	1
	1R
	1R
U	1
U	1
JN	1
U	1
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U]
	0 0 0 0 0 0 0 0 0 0 0

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40382W

40219

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201639

 Date Received:
 10/16/94

 Date Extracted:
 04/13/94

 Date Analyzed:
 05/13/94

 Sulfur Clean-up:
 NO

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	į
118-74-1	Hexachlorobenzene	0.0050	Ū	
58-89-9	gamma-BHC	0.0050	Ū	ĺ
309-00-2	Aldrin	0.028	7	
1024-57-3	Heptachlor-Epoxide	0.021		R
5103-74-2	gamma-Chlordane	0.0078		lŘ
5103-71-9	alpha-Chiordane	0.0057		Ì
39765-80-5	trans-Nonachlor	0.0050	υ	
72-55-9	4,4'-DDE	0.033	7	
60-57-1	Dieldrin	0.010	U	ĺ
72-54-8	4,4'-DDD	0.010		l
5103-73-1	cis-Nonachlor	0.010		
50-29-3	4,4'-DDT	0.010	U	ı
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

1.0

Dilution Factor:

Client ID No. Lab Name: Aquatec, Inc. K40383W Lab Code: AQUAI Contract: 91082 40219 Case: BIO SDG: Lab Sample ID: 201640 Phase Type: **Biota** Date Received: 10/16/94 Phase Weight: 10.0 Date Extracted: 04/13/94 Extraction: Soxhlet 05/13/94 Date Analyzed:

Sulfur Clean-up:

NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	Ū	
58-89-9	gamma-BHC	0.0050	Ū	
309-00-2	Aldrin	0.052	7	
1024 57 3	Heptachlor Epoxide	0.042		-R
5103-74-2	gamma Chlordane	0.018		R
5103-71-9	alpha-Chlordane	0.010	J	,
39765-80-5	trans-Nonachlor	0.0050	U	İ
72-55-9	4,4'-DDE	0.052	4	
60-57-1	Dieldrin	0.010	Ū	
72-54-8	4,4'-DDD	0.019		:
5103-73-1	cis-Nonachlor	0.017	5	
50-29-3	4,4' DDT	0.015		R
36355-01-8	Hexabromobiphenyl	0.020	U	,
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc. K40384W

Lab Code: AQUAI

Contract: 91082

Case: BIO SDG: 40219

Lab Sample ID: 201641

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 201641

Date Received: 10/16/94

Date Extracted: 04/13/94

Date Analyzed: 05/13/94

Sulfur Clean-up: NO

Client ID No.

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.043	J	
1024-57-3	Heptachler Epoxide	0.033		-R
5103-74-2	gamma-Chlordane	0.014		R
5103-71-9	alpha-Chlordane	0.0077		•
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.037	JN	
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.014		
5103-73-1	cis-Nonachlor	0.014	7	-
50 20 3	4,4' DDT	0.011		R
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

Client ID No. Aquatec, Inc. K40385W Lab Name: Lab Code: AQUAI Contract: 91082 SDG: 40219 Case: BIO Lab Sample ID: 201642 Phase Type: Date Received: 10/16/94 **Biota** Phase Weight: 10.0 Date Extracted: 04/13/94 9 Extraction: Soxhlet Date Analyzed: 05/13/94 Dilution Factor: 1.0 Sulfur Clean-up: NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachiorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.052	T	
1024 57 3	Heptachlor Epoxide	0.044		R
5103-74-2	gamma-Chlordane	0.020		Ŕ
5103-71-9	alpha-Chlordane	0.011		
39765-80-5	trans-Nonachlor	0.0050	Ū	
72-55-9	4,4'-DDE	0.057	J	ı
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.021		
5103-73-1	cis-Nonachlor	0.020		
50-29-3	4,4'-DDT	0.016		-R
36355-01-8	Hexabromobiphenyl	0.020	U	•
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO SDG: 40219

Lab Sample ID: 201643

Client ID No.

10/16/94 Phase Type: **Biota** Date Received: Phase Weight: 10.0 Date Extracted: 04/13/94 Extraction: Soxhlet Date Analyzed: 05/13/94 Dilution Factor: Sulfur Clean-up: 1.0 NO

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q
2052-07-5	2-Bromobiphenyl	0.010	U
2113-57-7	3-Bromobiphenyl	0.010	U
92-66-0	4-Bromobiphenyl	0.010	U
118-74-1	Hexachlorobenzene	0.0050	U
58-89-9	gamma-BHC	0.0050	U
309-00-2	Aldrin	0.042	J
1024-57-3	Heptachler Epoxide	0.036	
5103-74-2	gamma-Chiordane	0.014	
5103-71-9	alpha-Chlordane	0.0075	
39765-80-5	trans-Nonachior	0.0050	U
72-55-9	4,4'-DDE	0.034	NC
60-57-1	Dieldrin	0.010	U
72-54-8	4,4'-DDD	0.013	
5103-73-1	cis-Nonachlor	0.012	
50-29-3	4,4' DDT	0.010	
36355-01-8	Hexabromobiphenyl	. 0.020	U
8001-35-2	Toxaphene	0.20	U

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40392W

SDG: 40219

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201644
Date Received: 10/16/94
Date Extracted: 04/13/94
Date Analyzed: 05/13/94
Sulfur Clean-up: NO

				_
CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
2052-07-5	2-Bromobiphenyl	0.010	U	1
2113-57-7	3-Bromobiphenyl	0.010	U]
92-66-0	4-Bromobiphenyl	0.010	U	}
118-74-1	Hexachlorobenzene	0.0050	U	1
58-89-9	gamma-BHC	0.0050	U]
309-00-2	Aldrin	0.037	J]
1024 57 3	Heptachlor Epoxide	0.038		₽R.
- 5103 74 2	gamma Chlordane	0.015		R
5103-71-9	alpha-Chiordane	0.011] `
39765-80-5	trans-Nonachior	0.0050	U]
72-55-9	4,4'-DDE	0.070	ゴ	
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.024]
5103-73-1	cis-Nonachlor	0.019	J	1
50-29-3	4,4'-DDT	0.016		1R
36355-01-8	Hexabromobiphenyl	0.020	U	1
8001-35-2	Toxaphene	0.20	U]

 Lab Name:
 Aquatec, Inc.
 K40393W

 Lab Code:
 AQUAI

 Contract:
 91082

 Case:
 BIO

 SDG:
 40219

 Lab Sample ID:
 201645

 hase Type:
 Biota
 Date Received:
 10/16/94

Client ID No.

Phase Type:	Biota		Date Received:	10/16/94
Phase Weight:	10.0	g	Date Extracted:	04/13/94
Extraction:	Soxhlet		Date Analyzed:	05/13/94
Dilution Factor:	1.0		Sulfur Clean-up:	NO
•			_	

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	۵	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	U]
92-66-0	4-Bromobiphenyl	0.010	U]
118-74-1	Hexachlorobenzene	0.0050	U]
58-89-9	gamma-BHC	0.0050	U]
309-00-2	Aldrin	0.042	5]
1024-57-3	Heptachlor Epoxide	0.031		1R
5103 74 2	gamma Chlordane	0.012		R
5103-71-9	alpha-Chlordane	0.0075	JM	
39765-80-5	trans-Nonachlor	0.0050	U]
72-55-9	4,4'-DDE	0.074	7]
60-57-1	Dieldrin	0.010	U]
72-54-8	4,4'-DDD	0.022		}
5103-73-1	cis-Nonachlor	0.021]
50-29-3	4,4' DDT	0.017]R
36355-01-8	Hexabromobiphenyl	0.020	U] `
8001-35-2	Toxaphene	0.20	Ū]

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO

Client ID No. K40394W

40219

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

 Lab Sample ID:
 201646

 Date Received:
 10/16/94

 Date Extracted:
 04/13/94

 Date Analyzed:
 05/13/94

 Sulfur Clean-up:
 NO

SDG:

Q	N	CONCENTRATION (mg/Kg)	COMPOUND	CAS NO.
U		0.010	2-Bromobiphenyl	2052-07-5
Ū		0.010	3-Bromobiphenyl	2113-57-7
U		0.010	4-Bromobiphenyl	92-66-0
Ū		0.0050	Hexachlorobenzene	118-74-1
Ū		0.0050	gamma-BHC	58-89-9
		0.028	Aldrin	309-00-2
		0.022	Heptachlor Epoxide	1024 57 3
		0.012	gamma Chiordano	5103 74 2
		0.0079	alpha-Chlordane	5103-71-9
Ü		0.0050	trans-Nonachlor	39765-80-5
		0.054	4,4'-DDE	72-55-9
Ü		0.010	Dieldrin	60-57-1
		0.015	4,4'-DDD	72-54-8
য		0.014	cis-Nonachlor	5103-73-1
		0.012	4,4' DDT	50-29-3
Ū		0.020	Hexabromobiphenyl	36355-01-8
Ū		0.20	Toxaphene	8001-35-2

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40395W

40219

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet
Dilution Factor: 1.0

Lab Sample ID: 201647

Date Received: 10/16/94

Date Extracted: 04/13/94

Date Analyzed: 05/13/94

Sulfur Clean-up: NO

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	α	
2052-07-5	2-Bromobiphenyl	0.010	υ	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.037	4	
1024 57 3	Heptachlor Epoxide	0.031		R
5103-74-2	gamma Chiordane	0.015		R
5103-71-9	alpha-Chlordane	0.010		• •
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.075	4	
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.021		
5103-73-1	cis-Nonachlor	0.021		
50-29-3	4,4' DDT	0.017		R
36355-01-8	Hexabromobiphenyl	0.020	U	
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.
Lab Code: AQUAI
Contract: 91082
Case: BIO SDG:

Phase Type: Biota

Phase Weight: 10.0 g

Extraction: Soxhlet

Dilution Factor: 1.0

Lab Sample ID: 201648

Date Received: 10/16/94

Date Extracted: 04/13/94

Date Analyzed: 05/13/94

Sulfur Clean-up: NO

Client ID No.

K40396W

40219

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	υ	
2113-57-7	3-Bromobiphenyl	0.010	U	
92-66-0	4-Bromobiphenyl	0.010	U	,
118-74-1	Hexachiorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	U	
309-00-2	Aldrin	0.050	7	
1024-57-3	Heptachler-Epoxide	0.045		R
5103-74-2	gamma Chlordane	0.022		R
5103-71-9	alpha-Chlordane	0.014		``
39765-80-5	trans-Nonachlor	0.0050	U	
72-55-9	4,4'-DDE	0.088	4	}
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.038		
5103-73-1	cis-Nonachlor	0.026		
50-29-3	4,4'-DDT	0.022		R
36355-01-8	Hexabromobiphenyl	0.020	U	· `
8001-35-2	Toxaphene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40397W

40219

Phase Type: Biota
Phase Weight: 10.0 g
Extraction: Soxhlet

1.0

Dilution Factor:

Lab Sample ID: 201649

Date Received: 10/16/94

Date Extracted: 04/13/94

Date Analyzed: 05/19/94

Sulfur Clean-up: YES

SDG:

					_
	CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	Q	
ļ	2052-07-5	2-Bromobiphenyl	0.010	υ	
	2113-57-7	3-Bromobiphenyl	0.010	U	
Γ	92-66-0	4-Bromobiphenyl	0.010	U	
	118-74-1	Hexachlorobenzene	0.0050	Ū	
	58-89-9	gamma-BHC	0.0050	U	l
Г	309-00-2	Aldrin	0.025	7	
	1024-57-3	Heptachlor Epoxide	0.016		ł
	5103-74-2	gamma-Chlordane	0.0096		R
	5103-71-9	alpha-Chlordane	0.0087		
F	30765-80-5	trans Nonachier	0.0099		LR
	72-55-9	4,4'-DDE	0.043	J	Ì
	60-57-1	Dieldrin	0.010	U	
Г	72-54-8	4,4'-DDD	0.014		
	5103-73-1	cis-Nonachlor	0.012		1
	50 29 3	4,4' DDT	0.010		1
	36355-01-8	Hexabromobiphenyl	0.020	Ü	'
	8001-35-2	Toxanhene	0.20	U	

Lab Name: Aquatec, Inc.

Lab Code: AQUAI

Contract: 91082

Case: BIO

Client ID No. K40398W

40219

Phase Type: Biota
Phase Weight: 10.0 g

Lab Sample ID: ____ Date Received: ____ Date Extracted:

201650 10/16/94 04/13/94 05/19/94

Extraction: Soxhlet
Dilution Factor: 1.0

Date Analyzed: 05/19/8
Sulfur Clean-up: YES

SDG:

CAS NO.	COMPOUND	CONCENTRATION (mg/Kg)	a	
2052-07-5	2-Bromobiphenyl	0.010	U	
2113-57-7	3-Bromobiphenyl	0.010	Ü	
92-66-0	4-Bromobiphenyl	0.010	υ	
118-74-1	Hexachlorobenzene	0.0050	U	
58-89-9	gamma-BHC	0.0050	Ū	
309-00-2	Aldrin	0.040	J	
1024-57-3	Heptachlor Epoxide	0.025		
5103-74-2	gamma Chlordane	0.016		R
5103-71-9	alpha-Chlordane	0.013		
30765-80-5	trans Nonschier	0.014		R
72-55-9	4,4'-DDE	0.059	7	
60-57-1	Dieldrin	0.010	U	
72-54-8	4,4'-DDD	0.021		
5103-73-1	cis-Nonachlor	0.017	J	
50-29-3	4,4' DDT	0.014		R
36355-01-8	Hexabromobiphenyl	0.020	υ	
8001-35-2	Toxaphene	0.20	U	

MERCURY ANALYSES

<u>Introduction</u>

Analyses were performed according to USEPA CLP SOW ILM03.0.

The data validation process is intended to evaluate the data on a technical basis rather than a contract compliance basis. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission for validation. During the validation process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this valuation, qualifier codes may be added, deleted, or modified by the data validator. Validator qualified results are annotated with the following codes in accordance with National Functional Guidelines:

Concentration (C) qualifiers:

- U The analyte was analyzed for but not detected. The associated value is the instrument detection limit.
- B The reported value was obtained from a reading less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).

Quantitation (Q) qualifiers:

- E The reported value is estimated due to the presence of interference.
- M Duplicate injection precision not met.
- N Spiked sample recovery not within control limits.
- S Reported value was determined by the method of standard additions (MSA).
- W Post-digestion spike for Furnace-AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
- * Duplicate analysis not within control limits.
- + Correlation coefficient for MSA is less than 0.995.

Validation qualifiers:

- J The analyte was positively identified; however, the associated numerical value is an estimated concentration only.
- UJ The analyte was not detected above the reported sample detection limit. However, the reported limit is approximate and may or may not represent the actual limit of detection.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC test, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The recommended holding times for mercury analyses is 28 days from tissue homogenization. All samples were analyzed within this holding time.

2. Blank Contamination

Quality assurance blanks, i.e., preparation and calibration blanks, are prepared to identify any contamination which may have been introduced into the samples during sample preparation or analysis. Preparation blanks measure laboratory contamination during preparation. Calibration blanks measure instrument contamination and sample cross-contamination.

All calibration and preparation blanks were found to be acceptable, with no analytes detected above the CRQL.

3. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument is giving satisfactory daily performance.

3.1 Initial Calibration

The correlation coefficient of the initial calibration was greater than the minimum required 0.995.

3.2 Continuing Calibration

All continuing calibration verification standards were acceptable.

3.3 CRDL Standard

All CRDL standard recoveries were within acceptable limits.

4. Matrix Spike/Laboratory Duplicate

Matrix spike and laboratory duplicate data are used to assess the precision and accuracy of the analytical method.

4.1 Matrix spike

Recovery for the matrix spike was within acceptable limits.

4.2 Laboratory Duplicate

The difference between laboratory duplicates was within acceptable limits.

5. Laboratory Control Sample (LCS)

All recoveries were within the acceptable recovery limits.

6. Serial Dilution

No ICP analyses were performed, therefore no serial dilution was necessary.

7. Furnace QC

No furnace analyses were performed.

8. Method of Standard Additions (MSA)

No MSA were performed.

9. System Performance and Overall Assessment

Overall system performance was acceptable. Other than those deviation specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

Data Validation Checksheets

	YES	NO	NA
Data Completeness and Deliverables			
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?	X		
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Form I to IX			
Are all the Form I through Form IX labeled with:			
Laboratory name?	<u> </u>		
Sample No.?	X		
SDG No.?	X		
Correct units?	X		
Matrix?	X		
Raw Data			
Is the digestion log for flame AA/ICP present?			X
Is the digestion log for furnace AA present?			X
Is the distillation log for mercury present?	X		
Is the distillation log for cyanides present?			X
Are preparation dates present on sample preparation logs/bench sheets?	X		
Are the measurement read out records present for:			
ICP			X
Flame AA			X
Furnace AA			X
Mercury	X		
Cyanides			X
Is the data legible?	X		
Is the data properly labeled?	X		
Holding Times			
Were mercury analyses performed within 28 days?	<u> </u>		

	YES	NO	NA
Were cyanide distillations performed within 14 days?			X
Were other metal analysis performed within 6 months?			X
Form I (Final Data)			
Are all forms complete?	X		
Are correct units indicated on Form I's?	X .		
Are all "less than IDL" values properly coded with "U"?	X		
Are the correct concentration qualifiers used with final data?	X		
Was a brief physical description of samples given on Form I's?		X .	
Calibration			
Is a record of at least 2 point calibration present for ICP analysis?			X
Is a record of 5 point calibration present for Hg analysis?	X		
Is a record of 4 point calibration present for:			
Flame AA?			X
Furnace AA?			X
Cyanides?			X
Is one calibration standard at the CRDL level for all AA (except Hg) and cyanides analyses?			X
Is correlation coefficient less than .995 for:			
Mercury Analysis?	<u> x</u>		
Cyanide Analysis?			X
Atomic Absorption Analysis?			X
Form II A (Initial and Continuing Calibration Verifica	ation)	-	_
Present and complete for every metal and cyanide?	X		
Are all calibration standards (initial and continuing) within control limits for:			
Metals (90-110 %R)?			X
Hg (80-120 %R)?	X		
Cyanides (85-115 %R)?			X

	YES	NO	NA
Was continuing calibration performed every 10 samples or every 2 hours?	X		
Was the ICV for cyanides distilled?			X
Form II B (CRDL Standards for AA and ICP)			
Was a CRDL standard (CRA) analyzed after initial calibration for all AA metals (except Hg)?			×
Was a mid-range calibration verification standard distilled and analyzed for cyanide analysis?			X
Was a 2xCRDL (or 2xIDL when IDL>CRDL) analyzed (CRI) for each ICP run?			X
Was CRI analyzed after ICV/ICB and before the final CCV/CCB, and twice every eight hours of ICP run?			X
Are CRA and CRI standards within control limits for metals (60-120 %R)?	X		
Is mid-range standard within control limits for cyanide (80-120 %R)			Х
Form III (Initial and Continuing Calibration Blanks)			
Present and complete?	X		
Was an initial calibration blank analyzed?	X		
Was a continuing calibration blank analyzed after every 10 samples or every 2 hours (which ever is more frequent)?	X		
Are all calibration blanks (when IDL <crdl) (crdls)?<="" contract="" detection="" equal="" less="" limits="" or="" required="" td="" than="" the="" to=""><td>X</td><td></td><td></td></crdl)>	X		
Are all calibration blanks less than two times Instrument Detection Limit (when IDL>CRDL)?			Х
Form III (Preparation Blank)			
Was one prep. blank analyzed for:			
each Sample Delivery Group SDG)?	X		
each batch of digested samples?	X		
each matrix type?	X		
Is concentration of prep. blank value greater than the CRDL when IDL is less than or equal to CRDL?		X	

	YES	NO	NA
If yes, is the concentration of the sample with the least concentrated analyte less than 10 times the prep. blank?			×
is concentration of prep. blank value less than two times IDL, when IDL is greater than CRDL?			×
Is concentration of prep. blank below the negative CRDL?		X	
Form IV (ICP Interference Check Sample)	, .		
Present and complete?			X
Was ICS analyzed at beginning and end of run (or at least twice every 8 hours)?			X
Are all Interference Check Sample results inside the control limits (±20%)?			X
If no, is concentration of AI, Ca, Fe, or Mg lower than the respective concentration in ICS?			X
Form V A (Spiked Sample Recovery - Pre-Digestion/F	Pre-Distil	lation)	
Present and complete for:			
each SDG?	X		
each matrix type?	X		
Was field blank used for spiked sample?		X	
Are all recoveries within control limits (75-125)?	X		
If no, is sample concentration greater than or equal to four times spike concentration?		<u></u>	X
Are results outside the control limits (75-125%) flagged with "N" on Form I's and Form VA?	· · · · · · · · · · · · · · · · · · ·		X
Are any spike recoveries:			
less than 10%?		X	
between 10-74%?		X	
between 126-200%?		X	
greater than 200%?		X	
Form VI (Lab Duplicates)		. ——	
Present and complete for:		٠	
each SDG?	X		

·	YES	NO	NA
each matrix type?	X		
Was field blank used for duplicate analysis?		X	
Are all values within control limits (RPD 20% or difference ≤ ±CRDL)?	X		
If no, are all results outside the control limits flagged with an * on Form I's and VI?			X
Is any RPD (where sample and duplicate are both greater than or equal to 5 times CRDL) > 100%?			X
Is any difference between sample and duplicate (where sample and/or duplicate is less than 5xCRDL) > 2xCRDL?		X	
Form VII (Laboratory Control Sample)		·	
Was one LCS prepared and analyzed for:			
each SDG?	X		
each batch samples digested/distilled?	X		
Is LLCS "Found" value higher than the control limits on Form VII?		X	
Is LCS "Found" lower than the control limits on Form VII?		X	
Form IX (ICP Serial Dilution)			
Was Serial Dilution analysis performed for:			
each SDG?			X
each matrix type?			X
Was field blank(s) used for Serial Dilution Analysis?			X
Are results outside control limit flagged with an "E"" on Form I's and Form IX when initial concentration on Form IX is equal to 50 times IDL or greater.			X
Are any % difference values:			
> 10%?			X
≥100%?			X
Furnace Atomic Absorption (AA) QC Analysis			
Are duplicate injections present in furnace raw data (except during full Method of Standard Addition) for each sample analyzed be GFAA?			, X

	YES	NO	NA
Do the duplicate injection readings agree within 20% Relative Standard Deviation (RSD) or coefficient of Variation (CV) for concentration greater than CRDL?			
Was a dilution analyzed for sample with analytical spike recovery less than 40%?			X
Is analytical spike recovery outside the control limits (85-115%) for any sample?			X
Form VIII (Method of Standard Addition Results)			
Present?		X	
If no, is any Form I result coded with "S" or a "+"?		X	
Is coefficient of correlation for MSA less than 0.990 for any sample?			Х
Was MSA required for any sample but not performed?		X	
Is coefficient of correlation for MSA less than 0.995?			X
Are MSA calculations outside the linear range of the calibration curve generated at the beginning of the analytical run?		·	X
Was proper quantitation procedure followed as outlined in the SOW on page E-23?			×
Field Blank			
Is field blank concentration less than CRDL (or 2 x IDL when IDL > CRDL) for all parameters of associated aqueous and soil samples?			X
If no, was field blank value already rejected due to other QC criteria?			Х
Form X, XI, XII (Verification of Instrumental Paramet	ers)		
Is verification report present for:			
Instrument Detection Limits (quarterly)?	X		
ICP Interelement Correlation Factors (annually)?			X
ICP Linear Ranges (quarterly)?			X
Form X (Instrument Detection Limits)			
Are IDLs present for:			
all the analytes?	<u>X</u>		<u></u>
all the instruments used?	X		

	YES	NO	NA
Is IDL greater than CRDL for any analyte?		<u> </u>	
If yes, is the concentration of Form I of the sample analyzed on the instrument whose IDL exceeds CRDL,			X
greater than 5 x IDL.			
Was any sample result higher linear range of ICP.			
Was any sample result higher than the highest calibration standard for non-ICP parameters?		X	
If yes for any of the above, was the sample diluted to			Χ
obtain the result on Form !?			

Corrected Sample Analysis Data Sheets

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

/ Name: AQU	ATEC		Contract: 9	10	B 2	K40114W
The second of th						SDG No.: 40219
atrix (soil/	water): FISH	<u>_</u>		L	ab Samp	le ID: 196335
vel (low/me	d): LOW_	_		Da	ate Rec	eived: 09/03/93
Solids:	100.	0				
C	oncentration	Units (ug	/L or mg/kg dry	7 1	weight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7400 00 5			-		सक
	7429-90-5	Aluminum_		-		NR NR
	7440-36-0 7440-38-2	Antimony_ Arsenic		-		NR NR
		Barium		_		NR NR
•		Beryllium		-		NR
		Cadmium		_		NR
		Calcium		1		NR
		Chromium		-		NR
	7440-48-4			-		NR
		Copper		1	·	NR
		Iron		•		NR
	7439-92-1	Lead		_		NR
	7439-95-4	Magnesium		_		NR
		Manganese		-		NR
		Mercury	0.02	-		[cv]
		Nickel	**************************************	_		NR
	7440-09-7	Potassium		_		NR
	7782-49-2	Selenium		_		NR
	7440-22-4	Silver -		_		NR
	7440-23-5	Sodium		_		NR
	7440-28-0	Thallium		_		NR
	7440-62-2	Vanadium -		-		NR
	7440-66-6	Zinc				NR
		Cyanide		1		NR
lor Before:		Clarit	y Before:		·	Texture:
lor After:		Clarit	y After:		_	Artifacts:
mments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC		Contract: 9	108	2	K40115W	
b Code: AQU	AI_ Ca	se No.: BI	O SAS No.	: _	 ,	SDG No.: 40219	
trix (soil/	water): FISH	_		La	b Sampl	e ID: 196336	
vel (low/med	d): Low_	_		Da	te Rece	ived: 09/03/93	
Solids:	100.	0					
Co	oncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG	
		Γ					
	CAS No.	Analyte	Concentration	C	Q	M	
	7429-90-5	Aluminum		-		NR	
		Antimony -		-		NR	
	7440-38-2	Arsenic -				nr	
		Barium		-		NR	
	7440-41-7	Beryllium				NR	
		Cadmium_				NR	
	_	Calcium_				NR	
		Chromium_		_		NR	
		Cobalt		_		NR	
		Copper		_		NR	
		Iron		_		NR	
	· ·	Lead		 		NR	
		Magnesium		l-I		NR	
		Manganese		ൄ		NR	
		Mercury	0.02	B		CV	
		Nickel		-		NR	
		Potassium		_		NR	
		Selenium_		_		NR	
		Silver		_		NR	
	7440-23-5			_		NR	
	_	Thallium		_		NR	
	7440-62-2	Vanadium_		_		NR	
	7440-66-6	Zinc				NR	
		Cyanide		-		NR	
or Before:		Clarit	y Before:		•	Texture:	
or After:		Clarit	y After:		_	Artifacts:	
ments:							
							

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Lab Sample ID: 196337 Date Received: 09/03/93 g/kg dry weight): MG/KG cration C Q M NR NR NR NR NR NR NR NR NR NR NR NR NR
Date Received: 09/03/93 g/kg dry weight): MG/KG cration C Q M NR NR NR NR NR NR NR NR NR NR NR NR NR
g/kg dry weight): MG/KG cration C Q M NR NR NR NR NR NR NR NR NR NR NR NR NR
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NR NR
e: Texture:
: Artifacts:

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AOU	ATEC		Contract: 9	108	32	K40117W
						SDG No.: 40219
	- water): FISH					e ID: 196338
evel (low/me	d): LOW_			Da	te Rece	ived: 09/03/93
Solids:	100.	0				
Ce	oncentration	Units (ug	/L or mg/kg dry	y w	weight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	Aluminum		-		NR
	7440-36-0	Antimony_		-		NR .
	7440-38-2	Arsenic		-		NR
		Barium		-		NR
	7440-41-7			-		NR
	7440-43-9					NR
	7440-70-2	Calcium		1_1		NR
	7440-47-3	Chromium				NR
		Cobalt		[_[NR
	7440-50-8	Copper				NR
	7439-89-6	Iron		_		NR
		Lead				NR
		Magnesium		_		NR
_		Manganese		_		NR
		Mercury_	0.02	_		CV
	7440-02-0			_		NR
	7440-09-7			-		NR
•	7782-49-2			-		NR
	7440-22-4 7440-23-5	Sodium Sodium		-		NR NR
	7440-23-5			-		NR NR
	7440-28-0	Vanadium		-		NR NR
	7440-66-6	Zinc		-		NR
		Cyanide				NR
lor Before:		Clarit	y Before:			! Texture:
lor After:			y After:			Artifacts:
mments:						

INORGANIC ANALYSES DATA SHEET EPA SAMPLE NO.

Name: AQUATEC Co Lab Code: AQUAI Case No.: BIO Matrix (soil/water): FISH_ Level (low/med): LOW Solids: 100.0 Concentration Units (ug/L or Analyte Concentration Units (ug/L o	SAS No.: SDG No.: 40219 Lab Sample ID: 201638 Date Received: 10/16/93 mg/kg dry weight): MG/KG
CAS No. Analyte Concentration Units (ug/L or 7429-90-5 Aluminum Antimony Arsenic Barium	Date Received: 10/16/93 mg/kg dry weight): MG/KG
CAS No. Analyte Concentration Units (ug/L or 7429-90-5 Aluminum Antimony Arsenic Barium	mg/kg dry weight): MG/KG
CAS No. Analyte Concentration Units (ug/L or Ana	
CAS No. Analyte Conc. 7429-90-5 Aluminum Antimony Arsenic Barium	
7429-90-5 7440-36-0 7440-38-2 7440-39-3 Barium	entration C O M
7440-36-0 Antimony Arsenic Barium	Seriet actour C X In
7440-36-0 Antimony Arsenic Barium	
7440-38-2 Arsenic 7440-39-3 Barium	NR NR
7440-39-3 Barium	NR NR
	NR NR
	NR NR
7440-41-7 Beryllium	NR NR
7440-43-9 Cadmium	NR NR
7440-70-2 Calcium	NR NR
7440-47-3 Chromium	NR NR
7440-48-4 Cobalt	NR NR
7440-50-8 Copper	NR NR
7439-89-6 Iron	NR NR
7439-92-1 Lead	NR NR
7439-95-4 Magnesium	NR NR
7439-96-5 Manganese	NR NR
7439-97-6 Mercury	0.03 B CV
7440-02-0 Nickel	NR NR
7440-09-7 Potassium	NR NR
7782-49-2 Selenium_	NR NR
7440-22-4 Silver	NR NR
7440-23-5 Sodium	NR NR
7440-28-0 Thallium	NR
7440-62-2 Vanadium	NR
7440-66-6 Zinc	NR NR
Cyanide	NR NR
lor Before: Clarity Be	fore: Texture:
lor After: Clarity Af	ter: Artifacts:
mments:	

FORM I - IN

1 EPA SAMPLE NO.

		INORGANIC .	ANALYSES DATA S	SHEET	1
. Name: AQUA	K40382W				
		SDG No.: 40219			
Dan Code. ngor		JC 1.01. D1	- OAD NOT		
Matrix (soil/w	water): FISH	-		Lab Samp	ole ID: 201639
Level (low/med	l): LOW_	-		Date Rec	eived: 10/16/93
<pre>\$ Solids:</pre>	100.	0			
Co	ncentration	Units (ug	/L or mg/kg dry	weight)	: MG/KG
	CAS No.	Analyte	Concentration	CQ	M
	7429-90-5	Aluminum		-	NR
	7440-36-0	Antimony_			NR
	7440-38-2	Arsenic			NR
	7440-39-3	Barium		_	NR
	7440-41-7			_	NR
	7440-43-9			_	NR NR
	7440-70-2 7440-47-3	Calcium Chromium			NR NR
	7440-48-4	Cobalt		_	NR
	7440-50-8	Copper			NR
	7439-89-6	Iron			NR
	7439-92-1	Lead		-	NR
		Magnesium			NR
\sim	7439-96-5	Manganese		-	NR
		Mercury	0.03	-	cv
	7440-02-0	Nickel T		-	NR
	7440-09-7	Potassium			NR
,	7782-49-2	Selenium_			NR
	7440-22-4	Silver		_	NR
	7440-23-5	Sodium		_	NR
•	7440-28-0				NR
		Vanadium_			NR
	7440-66-6	Zinc Cyanide		_ -	NR NR
		Claurae_		_	-
Color Before:		Clarit	y Before:		Texture:
Color After:		Clarit	y After:		Artifacts:
Comments:					

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQUATEC			Contract: 91082			K40383W
						SDG No.: 40219
atrix (soil/	water): FISH	<u>_</u>		Lā	ab Sampl	le ID: 201640
evel (low/med	i): LOW_	-		Da	ate Rece	eived: 10/16/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y v	weight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
				_		
	7429-90-5	Aluminum_				NR
	7440-36-0	Antimony_		_		NR
,	7440-38-2	Arsenic		_		NR
	7440-39-3	Barium				NR
	7440-41-7	Beryllium				NR
	7440-43-9			_		NR
	7440-70-2			_		NR
	7440-47-3 7440-48-4			-		NR
				-		NR
		Copper		-		NR
		Iron		-		NR NR
				-		NR NR
	7439-95-4			-		NR NR
		Manganese	0.02	-		CV
•	7440-02-0	Mercury_	0.02			NR
	7440-02-0			-		NR NR
	7782-49-2			-		NR
	7440-22-4			-		NR NR
		Sodium		-		NR
	7440-23-3	Thallium		-		NR
	7440-28-0	Vanadium Vanadium		-		NR
	7440-66-6	Zinc		-		NR
	7440 00 0	Cyanide		-		NR
lor Before:		Clarit	y Before:	<u>ø; </u>	_	Texture:
lor After:		Clarit	y After:		-	Artifacts:
mments:						

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQUA	ATEC		Contract: 9:	108	32	K40384W
Lab Code: AQUI	AI_ Ca	se No.: BI	O SAS No.:	: _		SDG No.: 40219_
Matrix (soil/v	water): FISH	· 		La	ab Sampl	e ID: 201641
Level (low/med	i): Low_	_		Da	te Rece	ived: 10/16/93
% Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	y v	weight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	M
	7440-41-7 7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-92-1 7439-95-4 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-23-5	Aluminum_Antimony_Arsenic_Barium_Beryllium_Cadmium_Calcium_Chromium_Cobalt_Copper_Iron_Lead_Magnesium_Manganese_Mercury_Nickel_Potassium_Selenium_Silver_Sodium_Thallium_Vanadium_Zinc_Cyanide_Cyanide_Comparic_Co	0.02			NR NR NR NR NR NR NR NR NR NR NR NR NR N
Color Before:		Clarit	y Before:			Texture:
Color After:		Clarit	y After:		_	Artifacts:
Comments:						

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC		Contract: 91	108:	2	K40385W
						SDG No.: 40219
				_		
trix (soll/	water): FISH	_		La	o Samp.	le ID: 201642
vel (low/med	i): LOW_	_		Da	te Rec	eived: 10/16/93
Solids:	100.	0				
Co	oncentration	Units (ug	/L or mg/kg dry	, w	eight)	: MG/KG
	CAS No.	Analyte	Concentration		Q	м
	CAS NO.	MIGTACE	concentration		Q	M
		Aluminum		- -		NR
		Antimony		_ -		NR
	7440-38-2	Arsenic -		<u> </u>		NR
	7440-39-3	Barium				NR
		Beryllium				NR
		Cadmium				NR
	· ·	Calcium_				NR
	7440-47-3	Chromium				NR
	•	Cobalt				NR
	7440-50-8	Copper				NR
	7439-89-6	Iron				NR
		Lead				NR
	7439-95-4	Magnesium				NR
-		Manganese				NR
	7439-97-6	Mercury	0.03			CV
	7440-02-0	Nickel				NR
		Potassium				NR
	7782-49-2	Selenium		- -		NR .
	7440-22-4	Silver -		_ -		NR
	7440-23-5	Sodium		_ -		NR
	7440-28-0	Thallium		_ -		NR
	7440-62-2	Vanadium -		-1-		NR
	7440-66-6	Zinc		_ -		NR
		Cyanide				NR
				_ -		
lor Before:		Clarit	y Before:	4		Texture:
lor After:		Clarit	y After:	_		Artifacts:
mments:		•				

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

✓ Name: AQUA	ATEC		Contract: 9	108	32	K40386W
Lab Code: AQUA	I_ Ca	se No.: BI	O SAS No.	: _		SDG No.: 40219_
Matrix (soil/w	water): FISH	_		La	ab Sample	⊇ ID: 201643
Level (low/med	l): LOW_	_		Da	te Recei	ived: 10/16/93
% Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y w	weight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q I	<u> </u>
	7440-38-2 7440-39-3 7440-41-7 7440-43-9 7440-70-2 7440-47-3 7440-48-4 7440-50-8 7439-89-6 7439-95-4 7439-96-5 7439-96-5 7439-97-6 7440-02-0 7440-09-7 7782-49-2 7440-23-5 7440-28-0 7440-62-2	Antimony Arsenic Barium Beryllium Cadmium Calcium Chromium Cobalt Copper Iron Lead Magnesium Manganese Mercury Nickel Potassium Selenium Silver Sodium	0.02			
Color Before:		Clarit	y Before:	<u>«</u>	_ :	Texture:
Color After:		Clarit	y After:		_ 1	Artifacts:
Comments:						

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

b Name: AQUA	TEC		Contract: 9	1082_		K40392W
Lab Code: AQUA	I_ Ca	se No.: BI	SAS No.	:		SDG No.: 40219
Matrix (soil/w	_					e ID: 201644
Level (low/med): LOW			Date	Rece	ived: 10/16/93
% Solids:	100.	_				
•						
Co	ncentration	Units (ug	/L or mg/kg dry	y wei	ght):	MG/KG
	CAC No	33-4-				
	CAS No.	Analyte	Concentration		δ ₁	M
	7429-90-5	Aluminum		-		NR
•	7440-36-0	Antimony_				NR
	7440-38-2	Arsenic		_ _		NR
	7440-39-3	Barium_		_ <u></u>		NR
	7440-41-7 7440-43-9	Beryllium Cadmium		-		NR I
	7440-70-2			-		NR NR
	7440-47-3	Chromium				NR
	7440-48-4	Cobalt		-		NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron		-		NR
	7439-92-1	Lead		-		NR
	7439-95-4	Magnesium		-		NR
	7439-96-5	Manganese		-		NR
	7439-97-6	Mercury	0.02	B		CV
	7440-02-0	Nickel -				NR
į	7440-09-7	Potassium		-		NR
	7782-49-2	Selenium		-		NR
	7440-22-4	Silver -		-		NR
İ	7440-23-5	Sodium				NR
	7440-28-0	Thallium				NR
Į.	7440-62-2	Vanadium_				NR
[7440-66-6	Zinc				NR
ļ		Cyanide		_ _		NR
ļ				l l		l
Color Before:		Clarit	y Before:	<u>. </u>	•	Texture:
Color After:		Clarit	y After:		•	Artifacts:
Comments:						
			······································			

FORM I - IN

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

_ıb Name: AQU?	ATEC		Contract: 9:	1082		K40393W
						SDG No.: 40219
Matrix (soil/v						le ID: 201645
		_				
Level (low/med	i): row_	_		Dat	e Rec	eived: 10/16/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y we	ight)	: MG/KG
	CAS No.	31	G			T., I
	CAS NO.	Analyte	Concentration		Q	M
	7429-90-5	Aluminum		- -		NR
	7440-36-0	Antimony_		- -	-	NR
	7440-38-2	Arsenic		- -		NR
	7440-39-3	Barium —		- -		NR
	7440-41-7	Beryllium		- -		NR
	7440-43-9	Cadmium		- -		NR
	7440-70-2	Calcium				NR
	7440-47-3	Chromium				NR
	7440-48-4	Cobalt				NR
	7440-50-8	Copper		- -		NR
	7439-89-6	Iron				NR
	7439-92-1	Lead				NR
	7439-95-4	Magnesium				NR
	7439-96-5	Manganese				NR
	7439-97-6	Mercury	0.02	B		CV
	7440-02-0	Nickel				NR
	7440-09-7	Potassium				NR
•	7782-49-2	Selenium_				NR
	7440-22-4	Silver		_ _		NR
	7440-23-5	Sodium				NR
	7440-28-0	Thallium_				NR
	7440-62-2	Vanadium_		_ _		NR
	7440-66-6	Zinc		_ _		NR
		Cyanide		- -		NR
	i	!		_ _		1
olor Before:		Clarit	y Before:	6		Texture:
olor After:		Clarit	y After:			Artifacts:
omments:						
						
						

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA	SAMPLE	NO.
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ಮ Name: AQUA	TEC		Contract: 9:	108	2	K40394W
						SDG No.: 40219
trix (soil/w	water): FISH	<u>.</u>		La	b Samp	le ID: 201646
vel (low/med	l): LOW_			Da	te Rece	eived: 10/16/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
		ļ. <u> </u>		_ .		
	7429-90-5	Aluminum		_ .		NR
	7440-36-0	Antimony_		_ .		NR
	7440-38-2	Arsenic		_ .		NR
		Barium Beryllium		- -		NR NR
	7440-41-7			- -		NR NR
		Calcium		- -		NR NR
		Chromium		- -	 ,	NR NR
		Cobalt		- -		NR
		Copper		- -		NR
		Iron		- -		NR
		Lead		-1		NR
	1	Magnesium		- -		NR
•		Manganese		- :		NR
		Mercury	0.02			cv
		Nickel -		-1-		NR
	7440-09-7			- -		NR
•		Selenium		- -		NR
		Silver		- -		NR
		Sodium		-1-		NR
		Thallium		-1.		NR
	7440-62-2	Vanadium -		-1		NR
	7440-66-6	Zinc		-1.		NR
		Cyanide				NR
	l			_1.		lI
lor Before:		Clarit	y Before:	65		Texture:
lor After:		Clarit	y After:			Artifacts:
mments:						
						

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

→ D Name: AQUATEC		Contract: 9:	1082	K40395W
Lab Code: AQUAI_ Ca	se No.: BI	OSAS No.:	.	SDG No.: 40219_
Matrix (soil/water): FISH	<u>.</u>		Lab Samp	le ID: 201647
Level (low/med): LOW_			Date Rece	eived: 10/16/93
 	0			
		/L or mg/kg dry	y weight):	MG/KG
CAS No.	Analyte	Concentration	C Q	M
7429-90-5				NR
7440-36-0	Antimony_			NR
7440-38-2	Arsenic			NR
7440-39-3	Barium		-	NR
7440-41-7 7440-43-9	Beryllium Cadmium		-	NR NR
7440-70-2	Calcium		-	NR
7440-47-3	Chromium		-	NR
	Cobalt		-	NR
7440-50-8	Copper		-	NR
7439-89-6	Iron		-	NR
7439-92-1	Lead			NR
7439-95-4	Magnesium			NR
7439-96-5	Manganese			NR
7439-97-6	Mercury_	0.02		CV
7440-02-0	Nickel		_	NR
	Potassium			NR
7782-49-2	Selenium_			NR
I	Silver			NR
	Sodium Thallium		-	NR NR
7440-28-0	Vanadium Vanadium		-	NR NR
7440-66-6	Zinc		-	NR
7440 00 0	Cyanide		-	NR
Color Before:	Clarit	y Before:	<u>*</u>	Texture:
Color After:	Clarit	y After:		Artifacts:
Comments:				

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FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

⊶o Name: AQU	ATEC		Contract: 9	108	2	K40396W
ab Code: AQU	AI_ Ca	se No.: BI	O SAS No.	: _		SDG No.: 40219
atrix (soil/	water): FISH			La	b Sampl	le ID: 201648
evel (low/med	d): LOW_			Da	te Rece	eived: 10/16/93
Solids:	100.	0				
C	oncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
			<u> </u>			
	CAS No.	Analyte	Concentration	C	Q	M
	7429-90-5	Aluminum		[-[NR
	7440-36-0	Antimony		-		NR
	7440-38-2	Arsenic		-		NR
	7440-39-3	Barium —				NR
	7440-41-7	Beryllium		-		NR
	7440-43-9	Cadmium				NR
	7440-70-2	Calcium		-		NR
	7440-47-3	Chromium		-		NR
	7440-48-4	Cobalt				NR
	7440-50-8	Copper		-		NR
	7439-89-6	Iron				NR
		Lead				NR
_		Magnesium				NR
	7439-96-5	Manganese				NR
	7439-97-6	Mercury_	0.02			CV
		Nickel				NR
		Potassium				NR
•		Selenium_				NR
		Silver				NR
	1	Sodium		1_1		NR
	7440-28-0	Thallium				NR
	7440-62-2	Vanadium_				NR
	7440-66-6	Zinc		[]		NR
		Cyanide		-		NR
lor Before:		Clarit	y Before:	<u>.</u>		Texture:
lor After:		Clarit	y After:			Artifacts:

FORM I - IN

1 INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

Name: AQU	ATEC	<u></u>	Contract: 9	1082	2	K40397W
b Code: AQU	AI_ Ca	se No.: BI	OSAS No.	: _		SDG No.: 40219
trix (soil/	water): FISH	<u>_</u>		Lal	Samp	le ID: 201649
vel (low/me	g): rom_	_		Dat	te Rec	eived: 10/16/93
Solids:	100.	0				
C	oncentration	Units (ug	/L or mg/kg dr	y we	eight)	: MG/KG
	CAS No.	Analyte	Concentration	С	Q	м
	7429-90-5	X 111m 1 m11m		-		NR
	7440-36-0	Antimony		-		NR
	7440-38-2	Arsenic		- -		NR
	7440-39-3	Barium		- -		NR
		Beryllium		- -		NR
		Cadmium		- -		NR
		Calcium		- -		NR
		Chromium		- -		NR
		Cobalt		-		NR
	7440-50-8	Copper		- -		NR
		Iron		- -		NR
		Lead		- -		NR
	4	Magnesium		- -		NR
		Manganese		- -		NR
		Mercury	0.02	BI-		CV
		Nickel -			····	NR
		Potassium		- -		NR
•	7782-49-2	Selenium		[-[-		NR
		Silver -		- -		NR
	7440-23-5	Sodium		- -		NR
		Thallium		- -		NR
	7440-62-2	Vanadium -		- -		NR
	7440-66-6	Zinc -		- -		NR
		Cyanide		- -		NR
or Before:		Clarit	y Before:	j p.		Texture:
or After:			y After:			Artifacts:
TO 110 TTO 1						

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

√b Name: AQU	ATEC		Contract: 91	108:	2	K40398W
-			O SAS No.:	:		SDG No.: 40219
atrix (soil/	_					e ID: 201650
evel (low/med	i): Low_	-		Da	te Rece	eived: 10/16/93
Solids:	100.	0				
Co	ncentration	Units (ug	/L or mg/kg dry	y w	eight):	MG/KG
		<u> </u>				
	CAS No.	Analyte	Concentration	C	Q	M
	7429-90-5	A 1117 1 7117		- -		NR
_	7440-36-0	Antimony		- -		NR
	7440-38-2	Arsenic		- -		NR
	7440-39-3	Barium		- -		NR
	7440-41-7	Beryllium		- -		NR
	7440-43-9	Cadmium		[-]:		NR
	7440-70-2	Calcium		- -		NR
	7440-47-3	Chromium		- -		NR
	7440-48-4	Cobalt -		-		NR
	7440-50-8	Copper				NR
	7439-89-6	Iron		 - -		NR
	7439-92-1	Lead		- ·		NR
	7439-95-4	Magnesium		- -		NR
	7439-96-5	Manganese		- -		NR
	7439-97-6	Mercury	0.02	- ·		cv
	7440-02-0	Nickel -		- -		NR
		Potassium		- :		NR
•	7782-49-2	Selenium		- :		NR
	7440-22-4	Silver -		- :		NR
	7440-23-5	Sodium		- :		NR
		Thallium		- :		NR
	7440-62-2	Vanadium -		- ·		NR
	7440-66-6	Zinc		-		NR
		Cyanide		[=]:		NR
lor Before:	1	اا		1_1.		
			y Before:			Texture:
lor After:		Clarit	y After:			Artifacts:
mments:						
						
						

FORM I - IN

MISCELLANEOUS PARAMETERS

MISCELLANEOUS PARAMETERS

Sample ID	Description	Sex	%Lipid
K40114W	Golden Redhorse Sucker	male	5.22
K40115W	Golden Redhorse Sucker	male	5.94
K40116W	Golden Redhorse Sucker	male	3.65
K40117W	Golden Redhorse Sucker	male	2.20
K40381W	Golden Redhorse Sucker	female	3.13
K40382W	Golden Redhorse Sucker	male	1.18
K40383W	Golden Redhorse Sucker	male	2.75
K40384W	Golden Redhorse Sucker	female	2.27
K40385W	Golden Redhorse Sucker	male	1.42
K40386W	Golden Redhorse Sucker	female	2.64
K40392W	Golden Redhorse Sucker	male	4.89
K40393W	Golden Redhorse Sucker	female	4.44
K40394W	Golden Redhorse Sucker	male	2.50
K40395W	Golden Redhorse Sucker	female	3.57
K40396W	Golden Redhorse Sucker	male	4.08
K40397W	Golden Redhorse Sucker	male	2.46
K40398W	Golden Redhorse Sucker	male	3.42